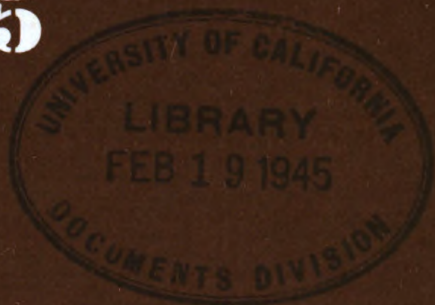


QUARTERMASTER HANDBOOK

TM 10-615



U.S. Dept. of Army
Technical Manual
**Refrigeration
Company**

MOBILE

WAR DEPARTMENT

Washington 25, D. C.

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**TM 10-615, Handbook for
the Quartermaster Refriger-
eration Company, Mobile,
is published for the infor-
mation and guidance of all
concerned.**

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**By order of the Secretary of
War:**

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(For explanation of symbols see FM 21-6)

TM 10-615

QUARTERMASTER

HANDBOOK

REFRIGERATION COMPANY

MOBILE

PURPOSE

This handbook is intended to provide the personnel of the quartermaster refrigeration company, mobile, with a source of condensed information on the organization, operation, and administration of the company. There has been no attempt to make this handbook exhaustive; it must be understood that it only supplements field manuals, technical manuals, training circulars, and other official publications. Its purpose is to furnish a convenient compilation of the basic information and data necessary for the efficient functioning of the company.



TABLE OF CONTENTS

CHAPTER I—THE COMPANY

	Par.	Page
Mission	1	5
General considerations in the combat zone	2	5
Table of organization	3	6
The cadre	4	6
Duties of key personnel	5	7

CHAPTER II—TRAINING

Basic training	6	21
Training programs for the company	7	21
General discussion of the training programs	8	21
Teaching methods	9	24
Developing the skill of personnel	10	24

CHAPTER III—GENERAL TECHNICAL INFORMATION

General	11	27
Causes of food spoilage	12	27
Principles of refrigeration	13	28
Principle of mechanical refrigeration	14	28
Setting up mobile refrigeration unit	15	33
Instructions for starting and operating the refrigeration unit	16	36

CHAPTER IV—FIELD OPERATIONS

General	17	43
Functions of the company during combat	18	44
Company administration during combat	19	44
Traffic circulation and control	20	46
Decentralization of control	21	47
Special considerations of various types of engagements	22	47
Sanitary measures	23	47
Protective measures	24	48
Loading for distribution	25	49
Conservation of refrigeration	26	49
Inspection of supplies	27	49
Loading capacity	28	50

CHAPTER V—SUPPLY AND REPLACEMENT OF EQUIPMENT

	Par.	Page	
Initial issue	29	51	U112 12 TM101
Replacement items	30	51	615
Individual clothing and equipment	31	52	1943
Forms used in requisitioning	32	52	44

CHAPTER VI—OVERSEAS MOVEMENTS

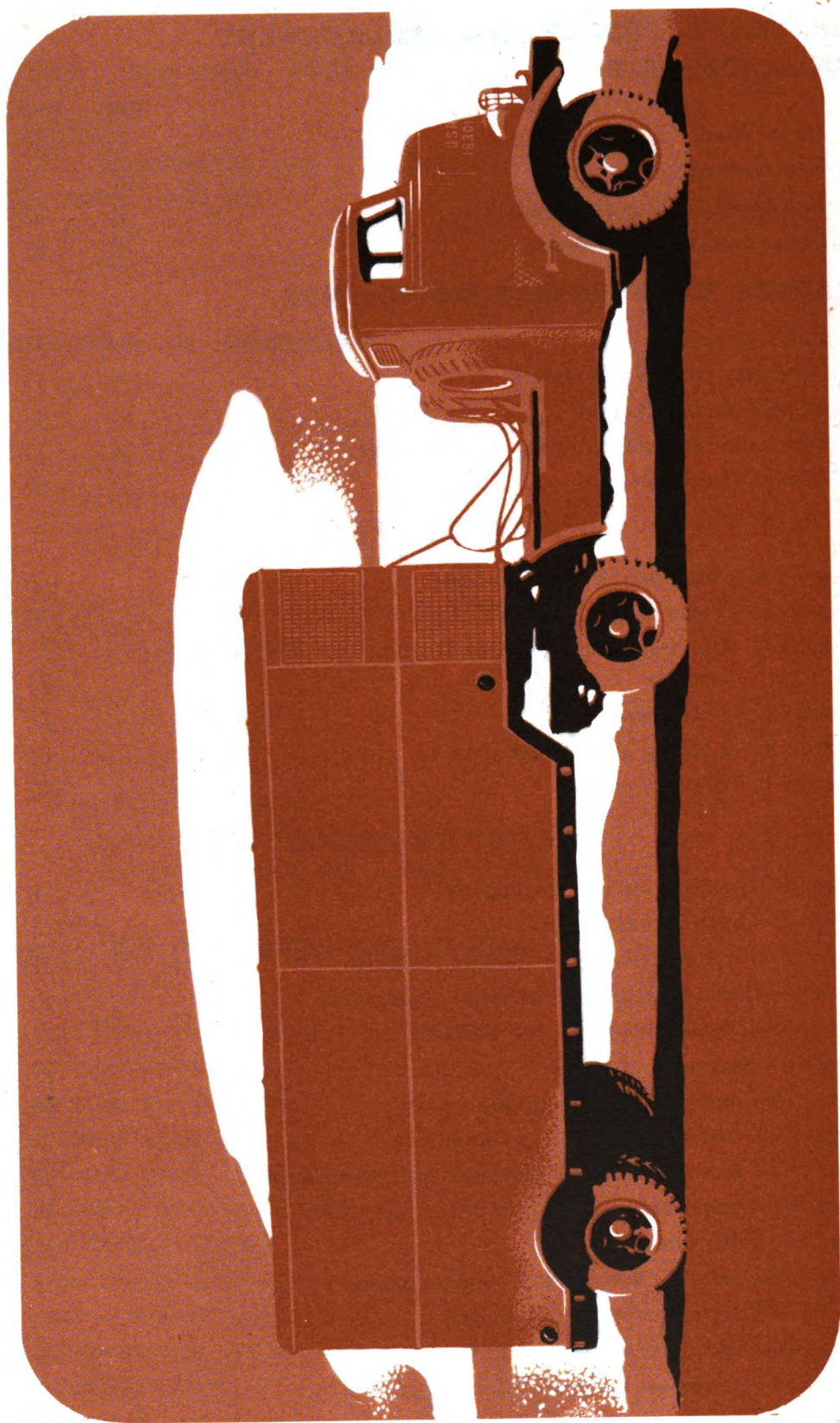
Initial procedure	33	53
Necessary records and rosters	34	53
At port of embarkation	35	57
Command responsibilities aboard transports	36	59
At port of debarkation	37	59

APPENDICES

Appendix A—Administrative Check Lists	60
Appendix B—Table of Equipment	70
Appendix C—Clothing and Equipment Required for Officers Ordered Overseas	75
Appendix D—References	77
Appendix E—Loading and storage data	81
Appendix F—Glossary	82

ILLUSTRATIONS

Figure 1—Organization of the company	8
Figure 2—Organizational chart	11
Figure 3—First thirteen weeks training program	22
Figure 4—Second thirteen weeks training program	25
Figure 5—Interior view from rear of trailer	26
Figure 6—Rear view of trailer	29
Figure 7—Compression refrigerating system	30
Figure 8—Cross-section of rotary compressor	31
Figure 9—Cross-section of reciprocating type compressor	32
Figure 10—Compression unit removed from the trailer	34
Figure 11—Fifth wheel	35
Figure 12—Operating side of truck-type ice engine	38
Figure 13—Diagram of refrigeration system	40
Figure 14—Diagram of wiring system	40
Figure 15—Thermostat for temperature control	41



CHAPTER I

THE COMPANY

	Paragraph
Mission	1
General considerations in the combat zone.	2
Table of organization.	3
The cadre	4
Duties of key personnel	5



1. MISSION. The mission of the mobile refrigeration company is to transport fresh meats and other perishable foods from the advance depot or other base where fixed refrigeration is provided to the division supply points when rail transportation is not available or cannot be utilized. These division supply points correspond to the division rail-heads when rail transportation is used. Supplies transported by mobile units are distributed through the regulating station to the division truck trains at the supply points. The mobile units are not intended to replace the normal distribution to units of the division that can be accomplished by trucks. Normally, this company has no functions in the zone of the interior.

2. GENERAL CONSIDERATIONS IN THE COMBAT ZONE. **a.** Complete plans for the operation of this company in any present or probable theater of operations cannot be made in advance. It is expected, however, that the company will function in areas of high temperatures, where it is difficult to preserve meats and other perishable foods.

b. The functions of the company are discussed in detail in Chapter IV, but it should be emphasized here that the service performed by this

company is merely auxiliary to rail transportation. Ordinarily, railheads are established, and when the daily train containing one or more carloads of perishable items of the type A ration arrives from depots, its contents are distributed to each division. When the use of railroad refrigerator cars is not practical, or when they are not available for the transportation of meats and other perishables, the quartermaster refrigeration company, mobile, is relied upon for the delivery of these items from advance depots to division supply points.

c. The terrain over which these trucks operate must be considered. Obviously, roads must be in good condition if the vehicles of this company are to move. It is desirable that no roads inferior to those of the secondary type be used. The rolling equipment of this company cannot move in a combat zone which consists of jungles, forests or swamps lacking solid surface roads.

3. TABLE OF ORGANIZATION. (See figure 1.) The quartermaster refrigeration company, mobile, is the only unit of the Quartermaster Corps which transports mechanically refrigerated perishable foods. Table of Organization 10-247 is the only one pertaining to a mobile refrigeration unit. It should be noted that there are no refrigeration battalions or regiments.

4. THE CADRE. The cadre constitutes the framework of a new unit. Its proper organization and training make possible the rapid and efficient preparation of a new unit for active operation. Cadremen fill the key administrative and supply positions of the company. They assist with the basic military and technical training of other enlisted men. The enlisted cadre of the quartermaster refrigeration company, mobile, consists of:

- a.** First sergeant.
- b.** Technical sergeant, refrigeration engineer.
- c.** Staff sergeant, mess.
- d.** Staff sergeant, motor.
- e.** Staff sergeant, supply.
- f.** Corporal, company clerk.
- g.** Technician, grade 4, cook.
- h.** Technician, grade 4, automobile mechanic.
- i.** Technician, grade 4, refrigeration mechanic.
- j.** Technician, grade 5, armorer.
- k.** Technician, grade 5, cook.
- l.** Technician, grade 5, refrigeration mechanic.
- m.** Four technicians, grade 5, heavy truck drivers.

5. DUTIES OF KEY PERSONNEL. (See figure 2.) One of the causes of inefficiency and lack of harmony in both military and civilian organizations, is the failure by higher authority to make clear to key personnel their duties, functions and responsibilities. Key personnel may be familiarized with their duties and responsibilities by means of an organizational chart. These charts must be prepared to fit each individual organization. Figure 2 is furnished as a general guide for the quartermaster refrigeration company, mobile. The more important duties of key personnel have been indicated, to assist officers and cadremen in delegating the work involved in activating, organizing, and training a company. In figure 2, details have been purposely eliminated.



a. Commissioned Officers. 1. *Company commander (captain).* The company commander, acting under instructions from higher authority, is both the administrator of the company (See Appendix A) and the director of its technical operations. Inasmuch as the quartermaster refrigeration company, mobile, is a separate company, its commanding officer is vested by Army Regulations with some of the authority usually exercised by a regimental commander. One example is his right to appoint noncommissioned officers without reference to higher authority. The quartermaster refrigeration company, mobile, has no normal peacetime functions. Hence, the decisions of the company commander in the zone of the interior, which are subject to review by the commanding officer of the post at which the company is stationed, will be concerned mostly with matters pertaining to administration and training. Personnel records normally will be kept by the personnel section of the post. In Chapter IV will be found a

	1	2	3	4	5	6	7	8	9
I	Unit	Technician grade	Company headquarters	3 platoons (each)			Total company	Enlisted cadre	Remarks
			Platoon head- quarters	3 sections (each)	Total platoon				
2	Captain.....		1			1			
3	First lieutenant.....			1		1			
4	Second lieutenant.....					2		aDrives truck.	
5	Total commissioned.....		1	1	1	4		bAssistant chauffeur in addition to other duties.	
6	First sergeant (585).....		1			1	1	Normal assignment.-	
7	Technical sergeant, including.....		1			1	1	Company or component thereof is for the purpose of transporting perishable supplies when other means are not available.	
8	Refrigeration engineer (322).....		(1)			(1)	(1)	Estimated capacity when time distance haul is one day:	
9	Staff sergeant, including.....		3	1	1	6	3	Section, I division.	
10	Mess (824).....		(1)			(1)	(1)	Platoon, I corps divisions).	
11	Motor (813).....		(1)			(1)	(1)	Company, army divisions).	
12	Platoon (651).....			(1)	(1)	(3)		The serial number symbol shown in parentheses is an inseparable part of the special designation. See A 615-26.	
13	Supply (821).....		(1)			(1)	(1)		
14	Sergeant, including.....			1	3	9			
15	Section leader (652).....			(1)	(3)	(9)			
16	Corporal, including.....		1			1	1		
17	Company clerk (405).....		(1)			(1)	(1)		
18	Technician, grade 4.....					9	3		
19	Technician, grade 5.....					43	7		
20	Private first class.....	including.....	10	4	7	25	12		
21	Private.....						21		
22	Armorer (511).....	5	(1)			(1)	(1)		
23	Bugler and messenger (803).....		(a1)			(1)			
24	Cook (060).....	4	(1)			(1)	(1)		
25	Cook (060).....	5	(1)			(1)	(1)		
26	Cook's helper (521).....		(2)			(2)			
27	Mechanic, automobile (014).....	4	(a1)	(a1)	(1)	(2)	(1)		
28	Mechanic, automobile (014).....	5				(2)			
29	Mechanic, refrigeration (322).....	4	(1)	(b1)	(b1)	(4)	(6)	(1)	
30	Mechanic, refrigeration (322).....	5				(7)	(1)		
31	Mechanic, refrigeration (322).....				(b2)	(6)	(18)		
32	Truck driver, heavy (245).....	5					(30)	(4)	
33	Truck driver, light (345).....	5	(1)	(2)	(3)	(11)	(1)		
34	Truck driver, light (345).....						(3)		
35	Wrecker, operator (359).....	5	(1)				(1)		
36	Basic (521).....				(1)	(3)	(9)		
37	Total enlisted.....		16	5	8	29	103	16	
38	Aggregate.....		17	6	8	30	107	16	
39	O Carbine, cal. .30.....		14	5	6	23	83		
40	O Launcher, rocket, AT.....		2	1		1	5		
41	O Machine gun, cal. .50.....		1		1	3	10		
42	O Rifle, cal. .30, M-1903.....		3	1	2	7	24		
43	O Trailer, 1-ton, 2-wheel, cargo.....		2				2		
44	O Truck, ¼-ton.....		1	1		1	4		
45	O Truck, ¾-ton, weapons carrier.....			1		1	3		
46	O Truck, 2½-ton, cargo.....		2				2		
47	O Truck, 4-5 ton, tractor.....			1	3	10	30		
48	O Truck, 4-ton, wrecker.....		1				1		
49	Q Semi-trailer, 2-wheel, van type, refrigeration.....			1	3	10	30		

8

further discussion of this phase when the company is in the theater of operations. The company commander alone is responsible for the training of the company, for its efficient administration, and for the maintenance of discipline. His responsibility for these matters can never be delegated. His commissioned and noncommissioned assistants perform the greater part of the detailed work involved, but the responsibility for results is the company commander's. The company commander is personally responsible for all property issued to his company even though one of his commissioned assistants is the supply officer. His duties and responsibilities include:

(a) The administrative work pertaining to his company in the nature of records, files, reports, correspondence and rosters. (Par. 2, AR 245-5.)

(b) Supply, including all of the paper work, inventories, issues, and inspections involved in making certain that his company is equipped as prescribed in the Table of Organization and Equipment. He is also held responsible for the proper use of property issued to him; (83rd and 84th articles of war). He normally receipts for equipment and supplies issued to him for the use of his company and he is responsible for the condition and quantity of items so issued. (Par. 5, AR 345-5 and Par. 15, AR 45-80.)

(c) He is responsible for the company mess, including all accounts and records (Par. 6, AR 245-5), for the quantity, appearance, and palatability of the food served, and for the cleanliness and efficiency of the kitchen.

(d) He is responsible for the health, morale, and general welfare of his men. Consideration of these items is an indispensable condition of basic leadership and is second in importance only to the tactical mission. A commander who is sincerely interested in the welfare of his men and sees to their well-being ahead of his personal convenience and comfort, will be repaid a hundredfold in their loyalty and performance of duties.

(e) The company commander will have custody of the company funds and will supervise their proper use.

(f) Even though his men may have been trained elsewhere, he must constantly endeavor to improve their skills and to promote the teamwork of the company.

(g) In addition to these duties and responsibilities, he is often called upon to serve on boards of inquiry, courts martial, and post exchange councils, and as an investigating officer, officer of the day, and in other capacities.

(h) The foregoing duties and responsibilities are substantially the same in the zone of the interior as in the theater of operations. If the company is well trained before its arrival in the theater of operations, the company commander will have relieved himself of practically all detailed work and will have more time for more important duties. At no time should he be so confined by detailed work that he is unable to function as an executive.



2. Platoon commander (lieutenant.) (a) The platoon commander is responsible for the training of his platoon, including both tactical and technical phases. He follows the training program, schedules, and general instructions of the company commander. The company commander is the only person in the company who may give instructions to the platoon commander. The platoon commander has the complete authority over his unit which his responsibility for results demands. He reports to the company commander any individual in his platoon who is to be disciplined. He should bear in mind that his platoon is not an administrative unit except when it is separated from the company. He is responsible for making certain that members of his platoon carry out the instructions of the company commander. Each platoon commander should endeavor to train his platoon so that it is self-sufficient.

(b) There are three platoons in this company, each commanded by a lieutenant. When the company is together, these officers are available for special duties in addition to their normal ones; such as mess officer, supply officer, motor officer, etc. The platoon commanders are responsible to the company commander for the development and training of the personnel of their several platoons as part of the company team. They should be encouraged to act on their own initiative as much as conditions permit, because they will be called upon to function as independent detachment commanders when the platoons which they command are attached to combat divisions.

QUARTERMASTER REFRIGERATION COMPANY, MOBILE (T/O 10-247)

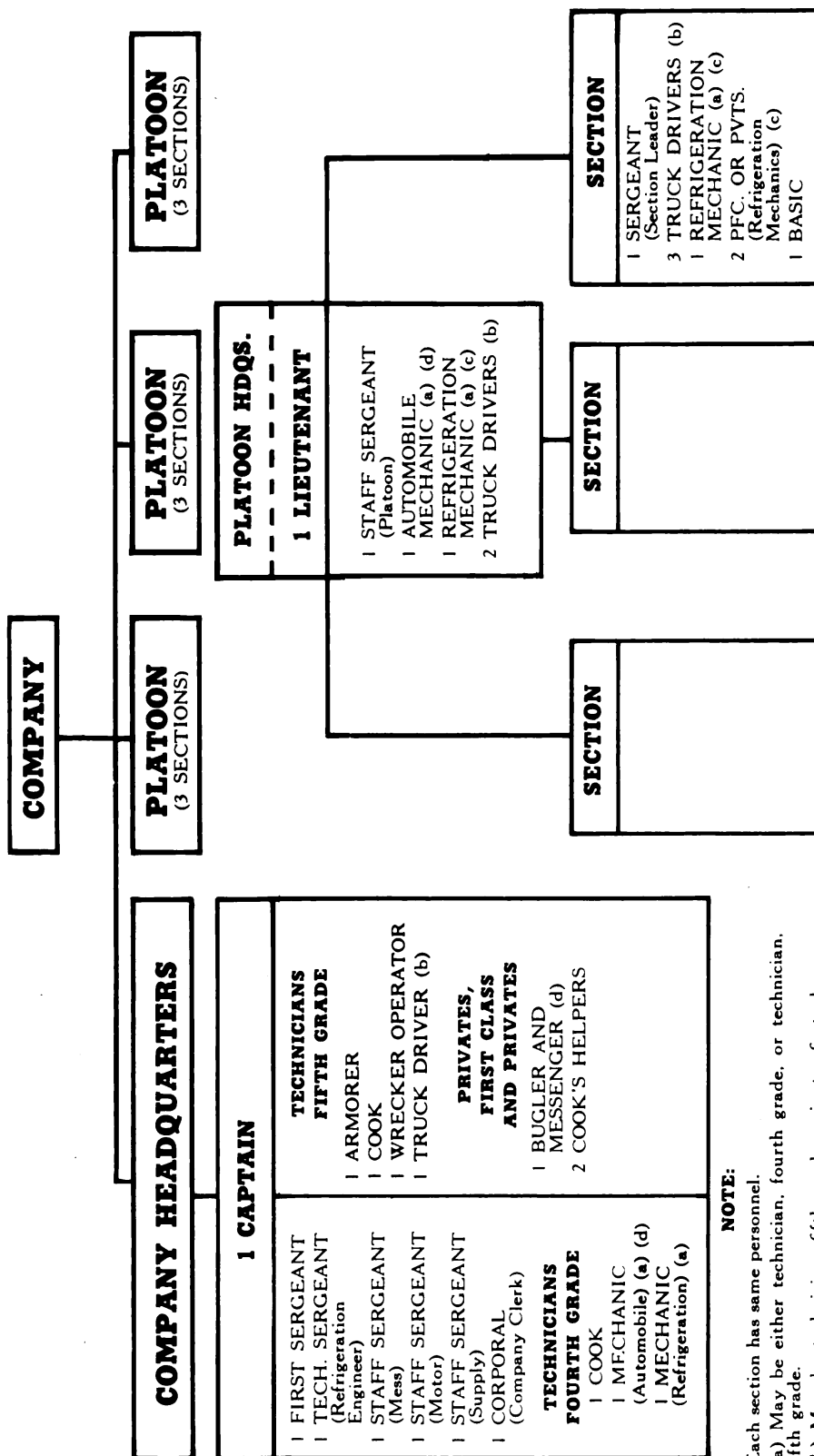


FIGURE 2

NOTE:

- Each section has same personnel.
- (a) May be either technician, fourth grade, or technician, fifth grade.
 - (b) May be technician, fifth grade, private, first class, or private.
 - (c) Assistant chauffeur in addition to other duties.
 - (d) Drives truck.

b. Noncommissioned Officers. 1. First sergeant. The first sergeant is the senior noncommissioned officer of the company. He is the noncommissioned administrative assistant to the company commander. The first sergeant is the personal assistant to the company commander, and is the contact man between the company commander and the enlisted men of the company. He forms the company (or any part of it) for drill, fatigue, guard, or other military formations; he checks the platoon sergeants' reports of those present and absent, and reports to the company commander the number of unauthorized absentees. He accompanies his commander on inspections of the barracks, the kitchen, and other company buildings and areas; he makes notes of violations of orders and transmits the company commander's instructions to the enlisted men. He sees that all fatigue, guard, and special details are turned out properly armed and equipped, and that they report at the proper place at the proper time.

(a) The first sergeant should know all of the men in the company, should be generally familiar with their backgrounds, and should know thoroughly their qualifications and abilities. He assists the company commander in maintaining discipline and morale, and brings before him any enlisted man who is to be admonished, reprimanded, or disciplined.

(b) In the event all company officers should become casualties in the combat zone, the first sergeant will assume command of the company until such time as new officers are assigned. In combat, the first sergeant remains with the company commander, assists him in maintaining contact with the platoon commanders, transmits instructions, controls the dispatch of messengers, and performs such other duties as the company commander may assign to him. He should at all times be familiar with the tactical situation and the company commander's plan of action.

(c) He gives permission to an enlisted man desiring to speak with the company commander. It is his responsibility to examine the merits of each case and to decide whether it should be brought to the attention of the company commander. The company commander usually gives the first sergeant authority to make decisions in minor matters of administration; but it is advisable that the men know if they are not satisfied with the decisions of the first sergeant, they may speak with the company commander. When a company is being organized, matters which seem of minor importance to the first sergeant may be of major importance to the new soldier, and until the company is running smoothly, the first sergeant may find it advisable to refer men to the company commander without question or objection if they desire to speak with

him personally. It should be clearly understood, however, by all of the enlisted personnel of the company, that they must speak with the first sergeant before they approach the company commander.

(d) In appendix A will be found a company commander's check list. On this list, each report and record he must keep is discussed. This check list contains information about the first sergeant's action on each company report of record.

(e) He assists the second-in-command and other company officers in the performance of administrative duties, and furnishes the company clerk, commander, and other company officers with the personnel data required to answer inquiries from higher authority. He keeps notes and, in general, supervises all clerical work, maintains schedules and rosters, assists in the issue of clothing and equipment, and performs or supervises all other detail work of an administrative character. The first sergeant should avoid making decisions which should be made only by the company commander. The platoon commanders make recommendations for increased ratings. The first sergeant makes recommendations for increased ratings for men in company headquarters. He makes sure that the other noncommissioned officers of the company understand the orders of the company commander. The first sergeant represents the company commander when he deals with the men, and he represents the men when they desire to express themselves through him to the company commander.

2. *Technical sergeant, refrigeration engineer.* This noncommissioned officer is the technical assistant to the company commander. AR 615-26 defines his general duties as follows:

"Installs, maintains, and repairs refrigerating equipment such as condensers, compressors, and motors used in refrigeration plants and to condition refrigeration plants. Assembles and connects various pipes and ducts used in piping brine and conditioned air, and detects and repairs leaks."

There are no essential differences in the general principles of operating and maintaining mobile refrigeration units and fixed refrigeration units. Such differences as do exist are inherent in the physical characteristics of the two, although mobile refrigeration units are a recent development. A refrigeration engineer assigned to this company will have no difficulty in adapting himself to the work required of him. This non-commissioned officer is responsible for the technical efficiency of the refrigeration mechanics. One of the latter accompanies each refrigera-

tion unit. The Table of Organization indicates that each of the refrigeration mechanics accompanying a unit acts as assistant chauffeur in addition to his other duties.

3. *Staff sergeant (mess).* (a) Good food properly prepared and served in an appetizing manner is a major factor in developing an efficient and satisfied company. A mess sergeant should thoroughly understand his responsibility in this matter.

(b) The following list is a guide for the mess sergeant:

1. The mess sergeant is in full control of the company kitchen and mess hall, under the supervision of the company commander. When the company commander appoints a mess officer, the mess sergeant functions under his general direction. (The mess officer makes inspections of the kitchen, storeroom, mess hall, garbage disposal methods, and the disposition of trash. He checks rations received. He is present at the serving of at least one meal each day. He inspects the mess accounts and all records pertaining thereto.)

2. Under the present system of field rations, the mess sergeant is not required to prepare menus or requisitions for subsistence supplies; nor need he make extensive purchases from commercial vendors. However, he should make a careful and detailed study of the standard menus prescribed by higher authority. He should hold daily conferences with the cooks on the preparation of the prescribed dishes, in order to insure that the articles of subsistence are properly used and that each dish is tastily and economically prepared.

3. He checks the daily menus against both items and quantities of subsistence stores issued to the company. He prepares for the guidance of the cooks each day the quantity breakdown of the various articles which go into the meal, and issues the correct quantities of each item. He sees that case goods and packages are left unopened until they are ready for use. Only unopened cases may be returned to the supply officer, if need be, and credit received.

4. He is responsible for the proper distribution of tasks among the mess personnel, and for the equitable distribution of the work load. He prepares a daily work schedule for the approval of the mess officer. When this schedule is approved, he sees that it is carried out. He checks and inspects all incoming stores, prepares for the mess officer a list of articles needed in addition to the items issued, and makes frequent inspections of all stores in the storeroom.

5. He is responsible for the cleanliness and good order of the kitchen, mess hall, and storerooms, and for the personal appearance of the mess personnel. He is responsible for the prompt and orderly serving of meals, and should take all necessary steps to insure that every man gets an adequate quantity of all foods on the menu. He should taste each article served to the men, so that he is certain all are well cooked.

6. The mess sergeant should make a detailed daily inspection of the kitchen, dining room, storerooms, and area outside the mess hall. He should also make frequent spot inspections of utensils, and of the method used in washing utensils and dishes. Every precaution should be taken to insure that all utensils and dishes are thoroughly scrubbed and sterilized after each usage, and that no article of food, soap, or residue of soapy water is left on them. Soapy residue may cause serious stomach disorders, and food particles left on dishes may spread disease among the troops.

7. The mess sergeant must make sure that each man in the mess maintains a high standard of personal cleanliness, and that he undergoes the required periodical medical inspection. Cleanliness of mess personnel cannot be too strongly stressed. Men should be required to keep their fingernails short and scrupulously clean at all times. Hair must always be short, and men should be required to wash their hands thoroughly with soap and hot water after each visit to the latrine. Under no circumstances should men with head colds or respiratory diseases be allowed to work in the kitchen. The same prohibition applies to men with open sores on any part of their bodies.

8. The mess sergeant should make sure that garbage and waste matter from the kitchen and mess hall are properly disposed of. On a rack outside the kitchen there should be three G. I. cans, one for each of the following classes of waste matter: food; paper, and such other materials that can be burned; tin cans and other metals (which should be pounded flat before being placed in the can). When a company is in the field, particular attention should be given to the proper disposal of garbage. The usual method of cleaning mess kits will be followed when the company is in the field. (Two cans of hot soapy water, one can of hot clean water for rinsing.)

9. The mess sergeant checks in the enlisted men detailed daily as kitchen police and table waiters, sees that they are in proper uniform, provides them with whatever additional uniform is required, and

sees that they are released on schedule and reported back to their organizations.

10. In making his daily inspection of the kitchen, mess hall, and the area used by the mess, the mess sergeant should watch particularly for the following:

a. Cheesecloth should be used to protect foods from flies and other insects.

b. The storeroom should be neat and clean.

c. Handles of knives and other implements should be free from grease and dirt. Pots and pans should be tested for grease by running a finger around the inside.

d. Potatoes, apples, citrus fruits, and vegetables should be examined to see that there is no decay or spoilage. Canned goods should be inspected for evidence of spoilage.

11. Every member of the permanent mess personnel should be required to study TM 10-405, The Army Cook.

12. The mess sergeant is responsible for the maintenance of discipline during the meal. He will report offenders to the commanding officer for disciplinary action. He will be sure that only the men entitled to eat in the company mess are admitted.

13. He is responsible for the guarding of subsistence supplies.

14. He frequently inventories tableware, kitchen utensils, and other items in daily use. He reports to the mess officer or the company commander all articles which are missing or damaged, together with the circumstances.

4. *Staff sergeant (motor).* (a) The motor sergeant may be considered the chief motor mechanic in this organization. He should be selected for his technical knowledge and mechanical ability. He should be well versed in field experience and in the various methods of handling vehicles when they are stalled or when the terrain is difficult.

(b) His duties include:

1. Supervising the operation of vehicle engines to insure prompt starting, proper warming up, and continued operation.

2. Riding, usually at the tail of the column, as a part of the maintenance group.
3. Observing vehicle operation on the march, and taking prompt corrective action when necessary.
4. Checking, or requiring mechanics to check, all vehicles during any march halt and upon completion of the day's run. Particular attention should be paid to excessively heated parts (gears, wheel bearings, engines, brakes, and the like).
5. Establishing the maintenance setup in the field, and notifying all concerned of its location.
6. Supervising the rescue or removal of stalled or disabled vehicles.
7. Diagnosing mechanical failures, and when necessary, giving mechanics instruction as to proper corrective action.
8. Allotting work to mechanics, and inspecting it during actual performance and after completion.
9. Supervising mechanics and their work.
10. Checking mechanics' adjustments and repairs.
11. Enforcing the schedule of maintenance work.
12. Coordinating the technical phases of motor supply with motor maintenance activities.
13. Making prescribed records and reports on scheduled preventive maintenance, and on servicing and repair work satisfactorily completed.

5. *Staff sergeant (platoon).* This noncommissioned officer is the executive for the platoon commander. He requires all men to comply with the platoon commander's orders. He sees to it that all other noncommissioned officers of the platoon exact from their subordinates obedience to lawful orders; that they treat their subordinates with dignity, fairness and impartiality; and that they require obedience to regulations and standards of courtesy, neatness, cleanliness, and military bearing. When the platoon commander is absent or disabled, the platoon sergeant assumes command of the platoon with the full responsibility and authority of the platoon commander.

6. *Staff sergeant (supply).* (a) The supply sergeant is the enlisted assistant to the company supply officer. The company commander will normally designate one of the lieutenants as company supply officer. This officer will be responsible for the supervision of supply activities. The supply sergeant will be in direct charge of the actual accomplishment of supply activities.

(b) The duties of the supply sergeant, under the direction of the supply officer, will include:

1. Supervising all labor details in drawing and handling supply.
2. Issuing supplies to personnel of the company.
3. Keeping the supply room neat and orderly, with items arranged for convenient display to inspecting officers.
4. Preparing requisitions for supplies and equipment.
5. Maintaining records of organizational and individual property issued to the men.
6. Preparing the required reports and statements. (See Appendix A.)
7. Supervising the marking of individual and company clothing and equipment.
8. Assisting the company commander or the supply officer in making periodic inventories of Government property.
9. Assisting in the issue of clothing and equipment to the men, making appropriate entries on individual clothing and equipment records, and checking the fit of clothing and shoes.
10. Assuming responsibility for the safeguarding of all property in his care, and for taking the necessary measures to prevent loss or damage by theft, fire, weather, moths, mildew, rust, vermin, rodents, and other causes.
11. Preparing ready reference data covering prescribed loading of vehicles in order to facilitate their loading. Speed and accuracy in loading vehicles (particularly at night without lights) should be practiced, using this data as a guide.
12. Assuming responsibility for fire extinguishers issued to the company. It is his duty to keep them in good condition. He should inspect

them frequently, and make certain that they are always prepared and available for immediate use.

13. Making a record of lockers or keys used by the company, of combinations, and of complete information pertaining to all keys.

14. Handling company laundry and all records pertaining to it.

15. Being prepared at all times to notify the company commander or the supply officer of any expendable or nonexpendable items required for the use of the company.

16. Having available at all times the up-to-date lists of property in the supply room. These lists are posted for inspection and ready reference.

17. Making certain that all equipment and supplies are in such condition that they can be used in the field without delay.

18. Keeping himself posted on any changes in basic allowances pertaining to the company.

19. Keeping a complete and up-to-date file of requisitions, memorandum receipts, and other documents pertaining to supply. This file should be in such form that the company commander or supply officer can obtain the information he desires in a very short time.

20. Keeping all property in his care serviceable and clean. To this end, he should make the general overhauling and inspection of property a routine matter, particularly after it has been used in the field or in field exercises.

21. Assuming responsibility for the care and repair of weapons which are assigned to the company and left in his custody. Particular attention should be given to the salvage of empty shells and other metallic items. Cleaning and preserving materials and their proper use are also his responsibility.

22. Making an immediate report of any shortage to the company commander or the supply officer. Any damaged or unserviceable property should also be reported promptly.

23. Initiating action in case property is lost, damaged, or destroyed through carelessness by any member of the company.

24. Drawing and retaining in his custody Government property for the use of the company. However, the supply officer signs the actual receipts for any property. Although individual issues of clothing are

made by him, they are witnessed and receipted for by an officer. If the property is issued for temporary use, it is the supply sergeant's responsibility to follow up and make certain that the property is returned within a reasonable time.

25. Taking custody of the property of men absent on furlough or temporary duty, in accordance with the policies of the company commander.

7. *Sergeant (section leader)*. This noncommissioned officer is responsible for the efficient operation of the company's basic operating element, the section. He is in charge of a group of 3 units, each consisting of one refrigeration semitrailer hauled by a tractor truck. This noncommissioned officer rides in a truck, 1/4-ton.

8. *Corporal (company clerk)*. This noncommissioned officer is in company headquarters. At this point, it is well to remember that this company is a *separate* company. In TM 12-250 will be found a resume of the duties of the company clerk. In Appendix A will be found a check list of paper work performed within this company, and the clerk should become familiar with it. When the company is at a post within the continental limits of the United States (zone of the interior), the company clerk will probably be assigned to the personnel office of the post. In the theater of operations when the company is assigned to an army, the company clerk will probably work under the supervision of the personnel officer of that army. When platoons are controlled by regulating officers, certain personnel records may be handled by the adjutant of the regulating station. When the company is neither attached nor assigned, all personnel records will be kept in the possession of the company. The company clerk will assist the first sergeant in the verification of clearness and correctness of reports. In general, whether in the zone of the interior or in the theater of operations, he is the assistant to the first sergeant, for whom he performs whatever clerical duties are required.

9. *Refrigeration mechanics*. Under technical direction of the technical sergeant (refrigeration engineer) and supervision of platoon commanders and section leaders, they maintain the refrigeration machinery in good operating condition, adjust mechanisms, and regulate temperatures.

CHAPTER II

TRAINING

	Paragraph
Basic training	6
Training programs for the company	7
General discussion of the training programs	8
Teaching methods	9
Developing the skill of personnel	10



6. BASIC TRAINING. The training program for this company calls for 4 weeks of basic military subjects. Some of the personnel will have already completed this basic training before they are assigned to the company, while others will not. The commanding officer of the company will see to it that any deficiencies in basic training are remedied.

7. TRAINING PROGRAMS FOR THE COMPANY.
See figures 3 and 4.

8. GENERAL DISCUSSION OF THE TRAINING PROGRAMS. **a. Commissioned officers.** Commissioned officers will be trained so that they, in turn, may train and supervise their personnel to work according to prescribed methods. They must also make plans for the functioning of the quartermaster refrigeration company in the theater of operations.

b. Noncommissioned officers. The most important part of a noncommissioned officer's training is that dealing with the manage-

FIRST THIRTEEN WEEKS' TRAINING PROGRAM

Subject	Text Reference	Total Hours	Hours Per Week												
			1	2	3	4	5	6	7	8	9	10	11	12	13
Basic military subjects.....	TM 10-610; T/O 10-247.....	256	48	48	48	48	8	8	8	8	8	8	8	8	8
Duties of personnel—Mission; organization; general plan of specialized training; functional setup.....	FM 101-10.....	12	.....	.....	.....	.....	6	6	.....	.....	.....	.....	.....	.....	.....
Organization of theater of operations—Supply establishments and their functions.....	TM 10-510; TF's 11-551 to 11-559 incl.; FS 10-43; T/O 10-247.....	60	.....	.....	.....	.....	16	16	14	14	.....	.....	.....	.....	.....
Vehicles and equipment—Types, use, operation, and maintenance (to include general repairs and service).....	TM 10-250; TM 10-210.....	24	.....	.....	.....	.....	10	10	4	.....	.....	.....	.....	.....	.....
Operation: Storage and issue; general application to subsistence items.....	TM 10-210; TM 10-250; TM 10-610.....	60	.....	.....	.....	.....	.....	14	14	16	16	.....	.....	.....	.....
Care of subsistence stores; meats, dairy products, fresh fruits and vegetables; inspection of perishables, spoilage (detection, causes, and prevention); principles of refrigeration; loading and unloading.....	TM 10-610.....	24	.....	.....	.....	.....	.....	.....	.....	4	8	12	.....	.....	.....
Sanitation; cleaning and defrosting; general principles; cleansing agents and their use.....	.....	116	.....	.....	.....	.....	.....	.....	.....	8	16	12	40	40	.....
Functioning as a unit; specific duties of individuals; team work; practical operations under competent supervision.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Specialist training: 1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cook (060).....	.....	(160)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Automobile mechanic (014).....	.....	(160)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Truck drivers (245) (345).....	.....	(160)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Reviews, examinations and demonstrations; corrections in training deficiencies; field exercise on operation of unit in the theater of operations; preparation of unit for activation.....	.....	48	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	48
Total.....	.....	624	48	48	48	48	48	48	48	48	48	48	48	48	48

¹ All specialists called for in T/O 10-247, 26 May 1943, such as truck drivers (245), automobile mechanics (014), and cooks (060), will normally be furnished from specialist schools of the Quartermaster Corps; but when necessary training of these men can be accomplished during a second 4-week training period by programs applicable to their specialties.

Refrigeration mechanics (322) will be trained at specialty schools and replacement training centers or obtained directly from inductees, at reception centers, having the necessary previous civilian specialty experience.

FIGURE 3

ment of his subordinates. In the field, his work must often be done without the supervision of a commissioned officer. Therefore, he must be trained to handle a group of men. In addition, he must know his duties as a noncommissioned officer thoroughly, and must master the details of his technical specialty. He must also be prepared to take the places of officers who become casualties.

c. The individual soldier. Every soldier must be trained:

- ① In basic military subjects.
- ② In the use and care of his own instruments or tools.
- ③ In performing his own particular duties.
- ④ In estimating the time and materials needed for a certain task (if he is an occupational or military specialist).
- ⑤ In preventive maintenance for the motor vehicle he drives.

d. The company. 1. Officers and men of each platoon and section must be trained to work as a team. The training program will help develop this teamwork.

2. Each man must not only understand his own job, but also have knowledge of the work done by every other officer and man in the company.

3. It is the duty of commissioned officers to find out how much each noncommissioned officer and man knows about his job, and how well he does it.

4. If any man has not had enough training, the commissioned officer must see that he gets more.

5. If the company has not been trained as a unit and each man does not know his exact duties, they should be explained to him. Then, field exercises should be given to perfect the individual and group practices, so that in unexpected situations personnel will not fail because of ignorance of their duties.

9. *TEACHING METHODS.* All officers and noncommissioned officers who will teach or train personnel should be thoroughly familiar with the following:

- a. FM 21-5, Military Training.
- b. FM 21-6, List of Publications for Training.
- c. FM 21-7, List of Training Films, Film Strips, and Film Bulletins.
- d. TM 1-1000, Vocational Training.
- e. Quartermaster Handbook, "Methods of Teaching."

10. *DEVELOPING THE SKILL OF PERSONNEL.*

a. The company will probably not operate in every climate and type of terrain, but its training should be carried out under as many different conditions as possible. Such training will reveal the conditions under which the company can operate efficiently.

b. Only the most competent noncommissioned officers should be selected to teach.

c. FM 21-5 contains a number of suggestions for practical exercises and for map and field problems. If possible, the platoons and sections should function semiindependently in field exercises, so that the men will develop confidence in acting on their own initiative, for in actual combat, platoons and sections may be many miles from each other and from company headquarters.

d. Particular emphasis should be placed on training in the handling of perishable foods, in the methods of loading and unloading, and in the general operating principles and care of refrigeration units. This can be done most efficiently under the direction of the technical sergeant (refrigeration engineer). He, in turn, works under the general direction of the commissioned officers of the company.

e. Practical work in the handling, loading, and unloading of containers should be directly supervised by the platoon and section leaders.

SECOND THIRTEEN WEEKS' TRAINING PROGRAM

Subject	Text Reference	Total Hours	Hours Per Week																			
			1	2	3	4	5	6	7	8	9	10	11	12	13							
BASIC MILITARY SUBJECTS:																						
Articles of war; pitching shelter, pyramidal, and wall tents; physical training and mass games; field sanitation; special weapons; close order drill; extended order drill; combat principles.	FM 7-10, 7-15, 8-40, 21-5, 21-10, 21-15, 21-20, 21-100, 21-150, 22-5, 23-7, 23-10, FM 23-30; TM 9-294, 9-390, 9-1225, 9-1270, 9-1990, 9-2200, TM 9-2210; TF 7-560, 7-561, 11-184, TF 11-235, FS 7-18, 7-19, 8-1, 8-2, 8-7, 8-9, 8-24; FS 8-39, MCM; TC's 87 and 104, WD 1942; TC's 22, 30, and 46, WD 1943.	80	8	8	8	8	8	8	8	8	8	8	8	8								
MAP READING:																						
Use of local road maps; selection of camp and operating sites; sketching.	FM 21-26, 21-35, 21-100, 25-10, FM 30-20; TM 21-300; TF 5-12, TF 11-556; FS 5-1.	20	4	4	4	4	4	4	4	4	4	4	4	4								
SECURITY:																						
Reconnaissance; defense against mechanized, guerrilla, chemical, air, and paratroop attack; concealment, dispersal, and camouflage; protective clothing; slit trenches and fox-holes.	FM 5-15, 5-20, 5-21, 10-10, 21-40, 21-45, 21-100, 21-150, 23-10, 30-25, 30-30, 30-31, 30-34, 30-35, 30-38, FM 30-39; TM 3-205, 5-267, 5-269, 5-325, TM 21-300; TF 3-650, 3-689, 5-146, 5-148, 5-149, 5-645, 5-646, 5-648, 5-649, 5-954, 5-961, 7-108, 7-234, 7-275, 7-280, 7-993, 21-1019, 21-1025, TF 25-394; FS 3-1, FS 3-15; TC 73, WD 1941; TC's 52, 75, and 86, 1942; TC's 8, 11, 25, and WD 1943.	40	4	4	4	4	4	4	4	4	4	4	4	4								
DECONTAMINATION:																						
Use of apparatus to decontaminate equipment, supplies and areas.	FM 21-40, FM 25-10; TM 3-215, 3-220, TM 8-285; TF 3-667, TF 3-687; FS 3-3, FS 3-11; TC 76, WD 1942.	16	4	4	2	2	2	2	2	2	2	2	2	2								
DEMOLITIONS:																						
How and when to demolish equipment and supplies.	FM 5-25, FM 23-30; TM 9-2900, TM 21-300; FS 7-4; TC's 5, 18 and 65, WD 1943.	16	.....	2	2	2	2	2	2	2	2	2	2	2							
OPERATIONS:																						
Care and handling of foods.	TM 10-210, 10-250, TM 10-610.	288	26	26	26	26	26	26	30	30	34	34	34	34								
Storage and issue.	TM 10-210, TM 10-250.																					
Sanitation of the trailer.	TM 10-610.																					
Bacteriology and food preservation.	TM 10-610.																					
Convoys—Close column, open column, and infiltration marches to be performed by actual driving.	FM 10-10, FM 25-10; TM 21-300.																					
Difficult driving—cold weather, desert and jungle conditions.	FM 10-10, FM 25-10; TM 21-300.	96	.....	48	48	48	48	48	48	48	48	48	48								
Disabled vehicles—use of winches, "A" frames, and other traction aids.	FM 10-10, FM 25-10; TM 21-300.																					
Blackout driving—driving in convoys, using marked and unmarked routes.	FM 10-10, FM 25-10; TM 21-300.																					
Trouble shooting and 2d echelon repairs.	TM 9-2810, 10-540, TM 10-1311.	20	2	2	2	2	2	2	2	2	2	2	2									
FIELD OPERATIONS:																						
Tactical and logistical functioning.	FM 21-100, FM 22-5; TM 10-210, 10-610, TM 10-1311; FS 8-13.																					
INSPECTIONS:																						
Basic and technical.		48	48	48	48	48	48	48	48	48	48	48	48	48								
Reviews, examinations, corrections in training deficiencies, and preparation of unit for activation.		20	2	2	2	2	2	2	2	2	2	2	2	2								
Total.		48	48	48	48	48	48	48	48	48	48	48	48	48								

FIGURE 4

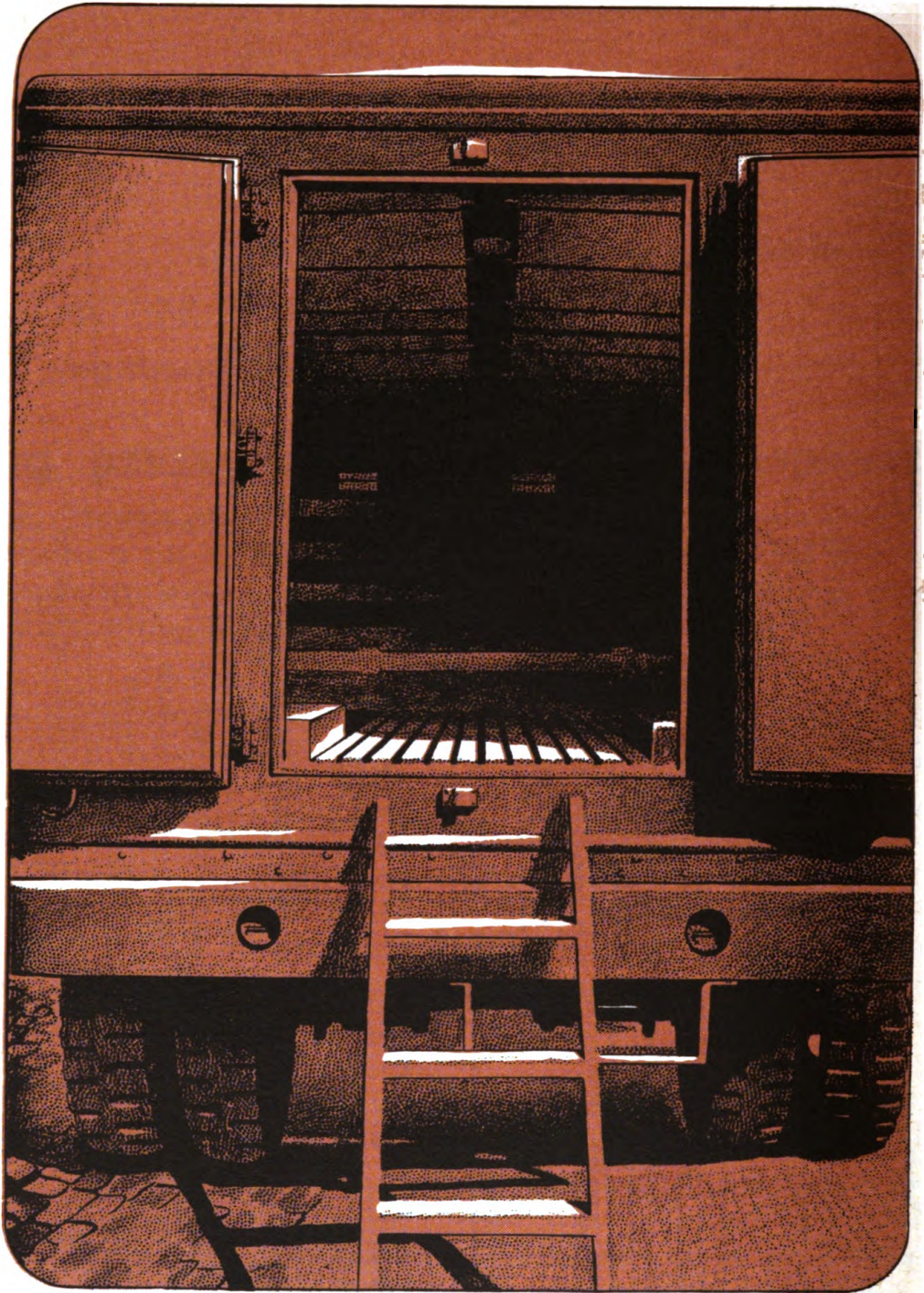


FIGURE 5
INTERIOR VIEW FROM REAR OF TRAILER—
MOBILE REFRIGERATION UNIT

CHAPTER III

GENERAL TECHNICAL INFORMATION

	Paragraph
General	11
Causes of food spoilage	12
Principles of refrigeration	13
Principle of mechanical refrigeration	14
Setting up the mobile refrigeration unit	15
Instructions for starting and operating the refrigeration unit	16



11. GENERAL.

It is not intended that this handbook contain all the technical information necessary for conducting a training course in mechanical refrigeration. However, an effort has been made in this chapter to include certain basic data for the convenience of refrigeration company personnel. The information included is of a general nature and in most cases applies to fixed installations as well as mobile units. In addition to this handbook each unit should be equipped with a manufacturer's manual, giving in detail all instructions for the unit's proper operation, maintenance, and repair. There should also be available for use of personnel, Subsistence Bulletin No. 21, TM 10-610, Circular Letter No. 291, OQMG (1941), and Supplement No. 1 to Circular Letter No. 291.

12. CAUSES OF FOOD SPOILAGE.

a. Spoilage of perishable food is usually caused by two processes:

- 1 Continuation of life processes in food substances such as fruits, vegetables, grains, etc. Such goods are living things and normally pass through the stages of development, maturity, and disintegration.

2. The action of microorganisms (bacteria, molds, yeasts). These organisms are omnipresent and propagate rapidly under favorable conditions of warmth, moisture, and food supply.

b. Food preservation aims to prevent or retard these two processes. The four methods of food preservation are drying, curing, canning and refrigeration.

13. PRINCIPLES OF REFRIGERATION.

a. Refrigeration means cooling, and is a term usually applied to artificial means of lowering temperatures.

b. The preservation of food by refrigeration is accomplished by lowering temperatures to the point where life processes are retarded, if not stopped, and by controlling two essentials for the growth of microorganisms: warmth and moisture.

c. Knowledge of certain natural laws must be applied in the process of refrigeration. Cold is the absence of heat, and heat is energy which cannot be destroyed. Heat can, however, be transferred from one substance to another, but it flows in *one* direction only: from a body of a higher temperature to a body of a lower temperature.

d. The process of refrigeration, therefore, becomes a method of exposing the substance to be cooled to the action of some agent capable of absorbing and transferring heat.

14. PRINCIPLE OF MECHANICAL REFRIGERATION.

a. Mechanical refrigeration makes use of certain chemicals called refrigerants, whose temperature changes cover a wide range when they are subjected to partial vacuums or to pressures. Among these refrigerants are carbon dioxide, methyl chloride, sulphur dioxide, and Freon gas. Freon has been designated by U. S. Army specifications as the standard refrigerant for mobile refrigeration units.

b. The principle of mechanical refrigeration is based upon the property of liquids of absorbing heat in changing from liquids to gases. When these gases are compressed they give off heat and are reconverted to their original liquid state. A refrigerant, therefore, must have a boiling point below the temperature of desired refrigeration. Freon has a boiling point of -21.7°F .

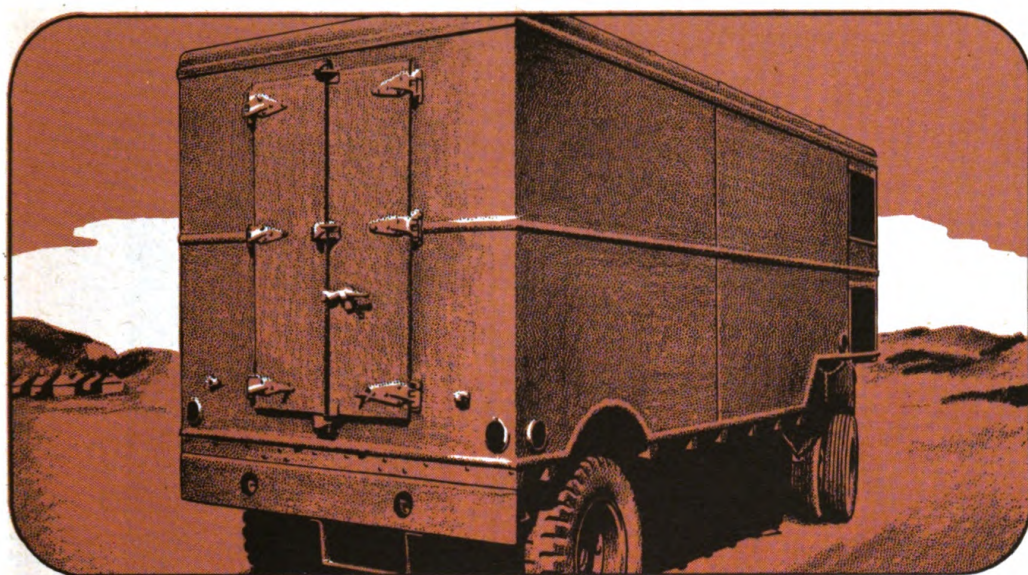


FIGURE 6

REAR VIEW OF TRAILER—MOBILE REFRIGERATION UNIT

c. The refrigeration system employs a mechanically driven compressor for withdrawing the low temperature vapor from the evaporator and compressing it to a pressure sufficiently high that it may be condensed by water or air.

d. The complete cycle of evaporation, compression, and condensation may be outlined as follows:

- 1** Evaporation of liquid at low temperatures by heat absorbed in the refrigeration chamber.
- 2** Compression of these vapors.
- 3** Condensation of the vapors at high temperatures in the condenser.
- 4** Throttling of the liquid by use of an expansion valve between the liquid under high pressure and the low pressure in the evaporator.

e. Either rotary or reciprocating types of refrigerant compressors are used in mobile refrigerant units. Both types of unit are driven by direct or belt connected gasoline engines.

f. The compressor, engine, refrigerant condenser, engine radiator, and accessories are mounted on a removable chassis supported on rubber bushings or springs. This chassis is located in the forward end of the trailer body, insulated from the refrigerated space, and is accessible by opening the front doors. A thermostat mounted within the refrigerated space automatically controls the operation of the unit.

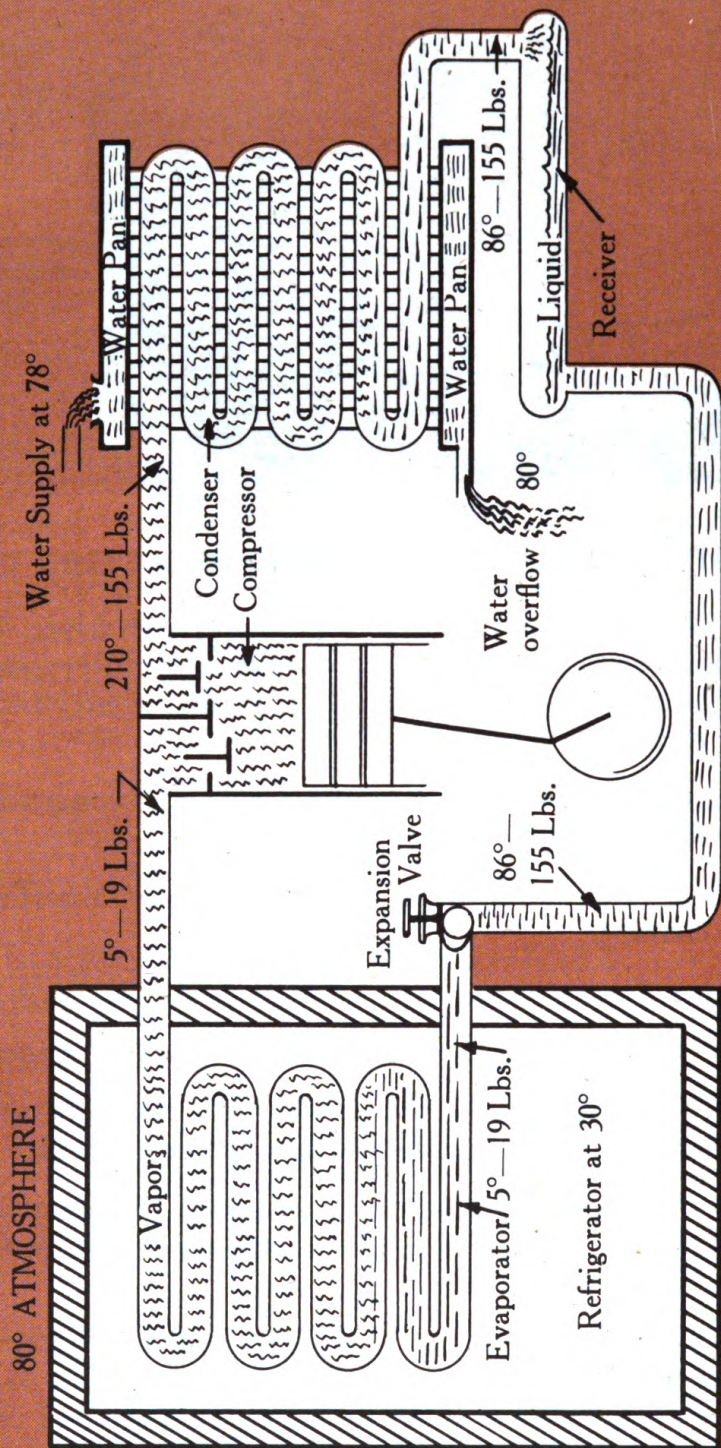


FIGURE 7

COMPRESSION REFRIGERATING SYSTEM

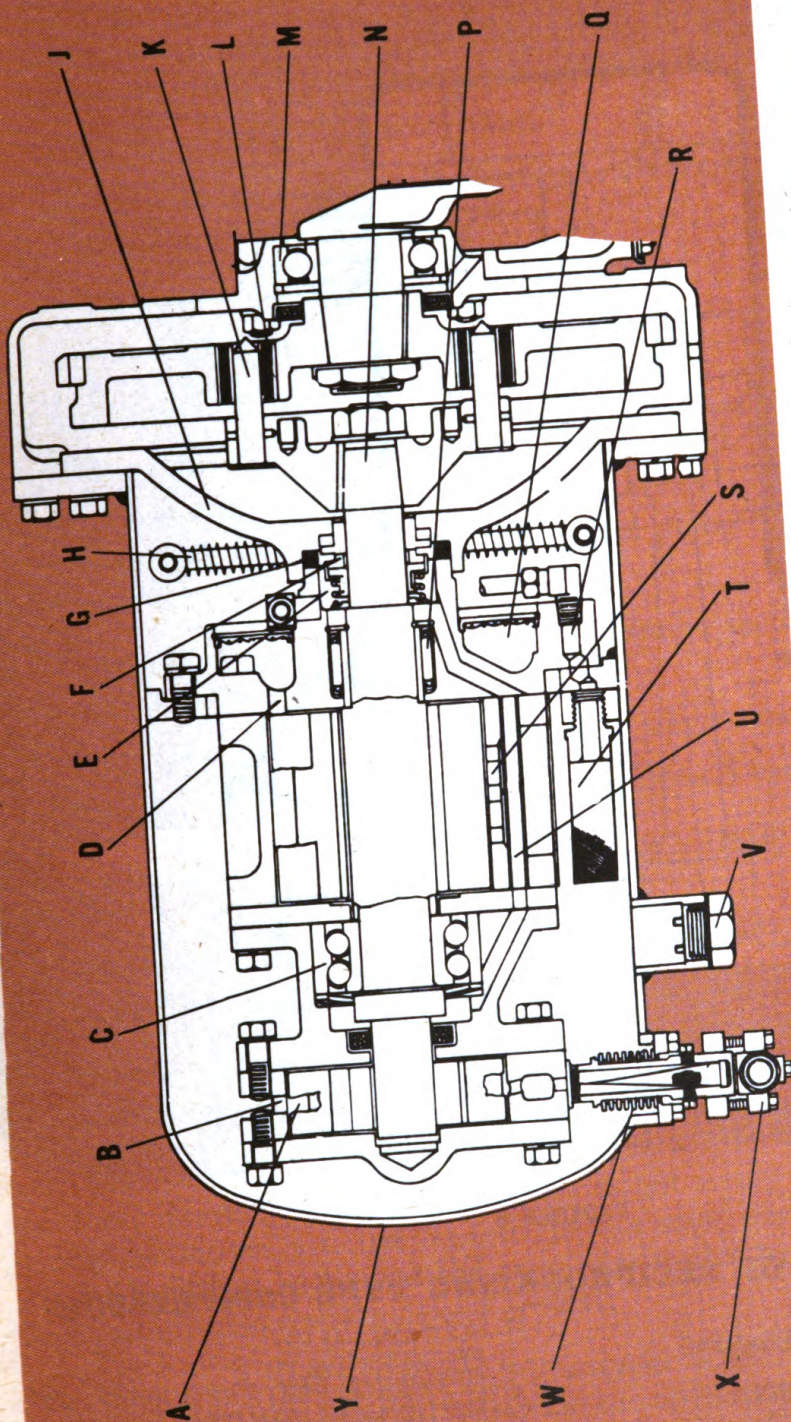


FIGURE 8
CROSS-SECTION OF ROTARY COMPRESSOR

A—Second stage rotary compressor large clearance—intake side. B—Intake ports of second-stage compressor. C—Double row rear ball bearings. D—Intake ports of first stage compressor. E—Front bearing and seal compartment. F—Refrigerant shaft seal. G—Front bearing and seal house packing. H—Fin-tube oil cooling line. J—Compressor outside front cover. K—Four-pin compressor drive coupling. L—Rubber bushing for coupling drive in engine flywheel. M—Engine rear main bearing. N—Compressor shaft. O—Refrigerant intake screen. P—Rubber bushing for coupling drive in engine flywheel. Q—Discharge ports intermediate line. R—Front needle bearing. S—Discharge ports intermediate line. T—Lubricating oil copper tube connection to rear bearing oiling passage. U—Lubricating oil copper tube connection to rear bearing oiling passage. V—Flexible connection from high pressure discharge port to outside refrigerant line. W—High pressure refrigerant valve. X—Drawn steel compressor housing shell. Y—Flexible connection from high pressure discharge port to outside refrigerant line. Z—Flexible connection from high pressure discharge port to outside refrigerant line.

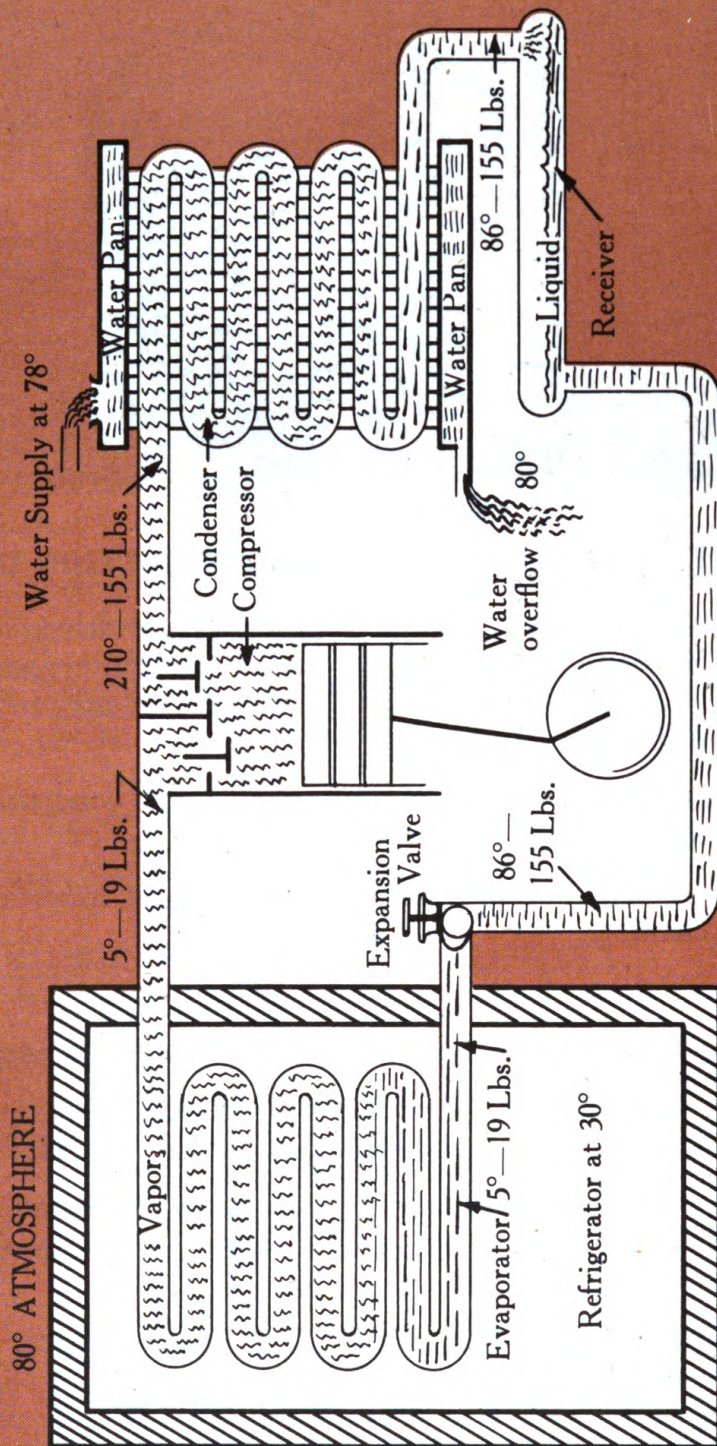


FIGURE 7

COMPRESSION REFRIGERATING SYSTEM

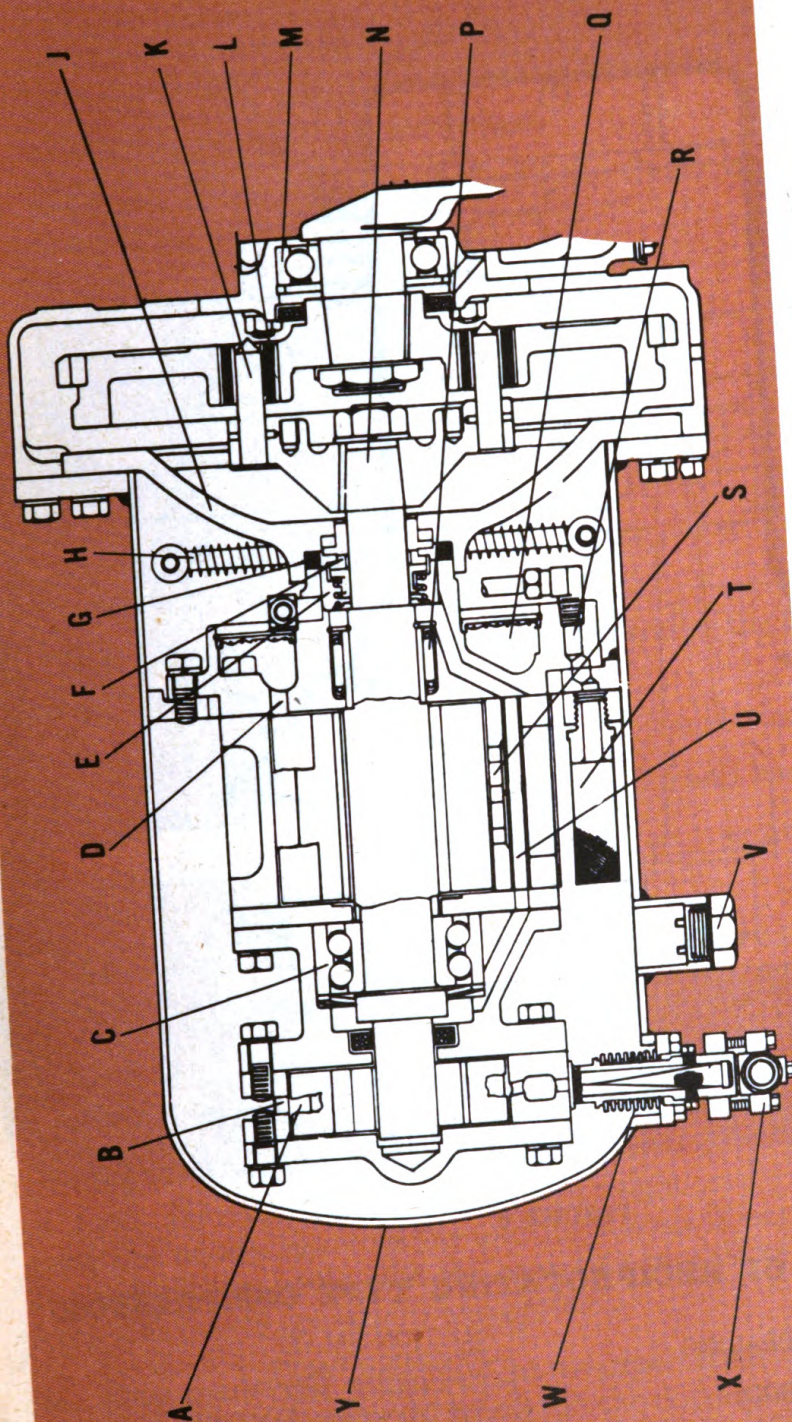


FIGURE 8

CROSS-SECTION OF ROTARY COMPRESSOR

A—Second stage rotary compressor large clearance—intake side. B—Intake ports of second-stage compressor. C—Double row rear ball bearings. D—Intake ports of first stage compressor. E—Front bearing and seal compartment. F—Refrigerant shaft seal. G—Front bearing and seal house packing. H—Fin-tube oil cooling line. J—Compressor outside front cover. K—Four-pin compressor drive coupling. L—Rubber bushing for coupling drive in engine flywheel. M—Engine rear main bearing. N—Compressor shaft. P—Front needle bearing. Q—Refrigerant intake screen. R—Lubricating oil passages. S—Discharge ports intermediate pressure. T—Lubricating oil strainer. U—Lubricating oil copper tube connection to rear bearing oiling passage. V—Magnetic oil drain plug. W—Flexible connection from high pressure discharge port to outside refrigerant line. X—High pressure refrigerant valve. Y—Drawn steel compressor housing shell.

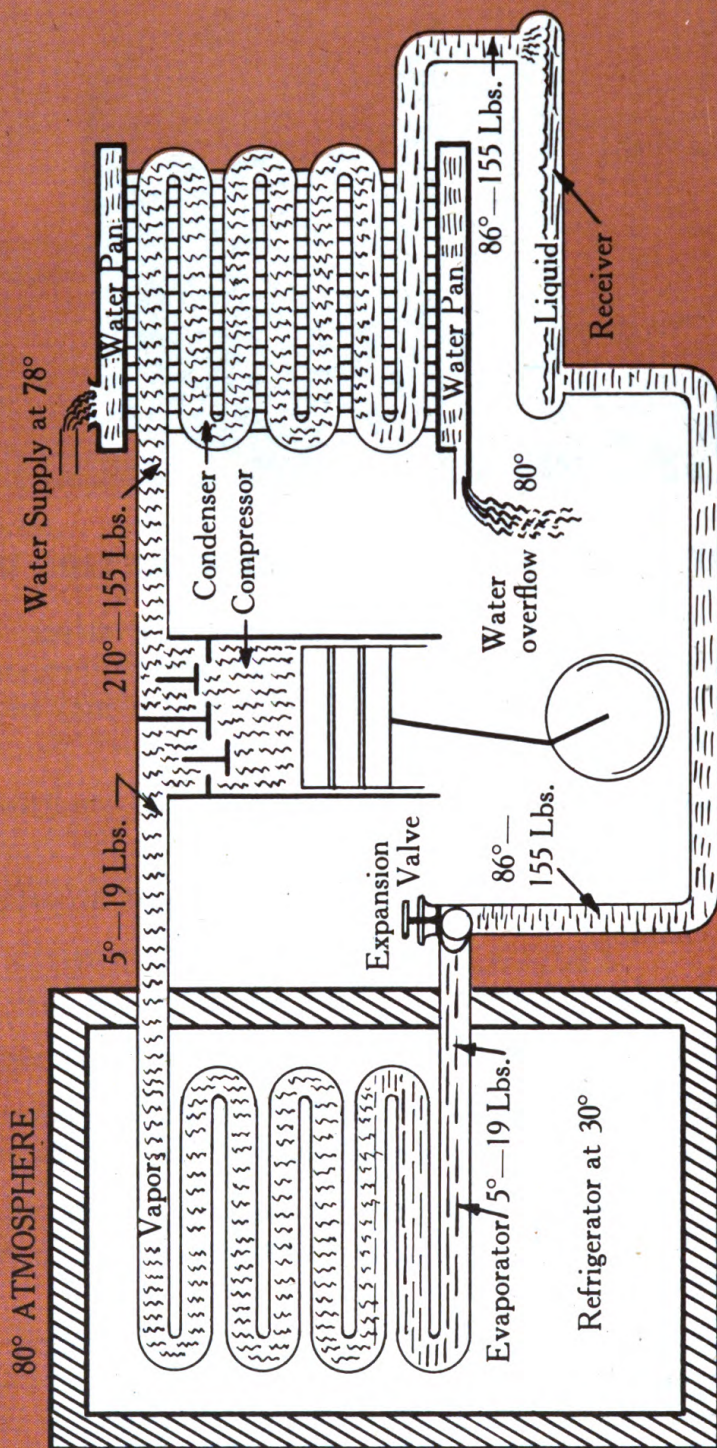


FIGURE 7
COMPRESSION REFRIGERATING SYSTEM

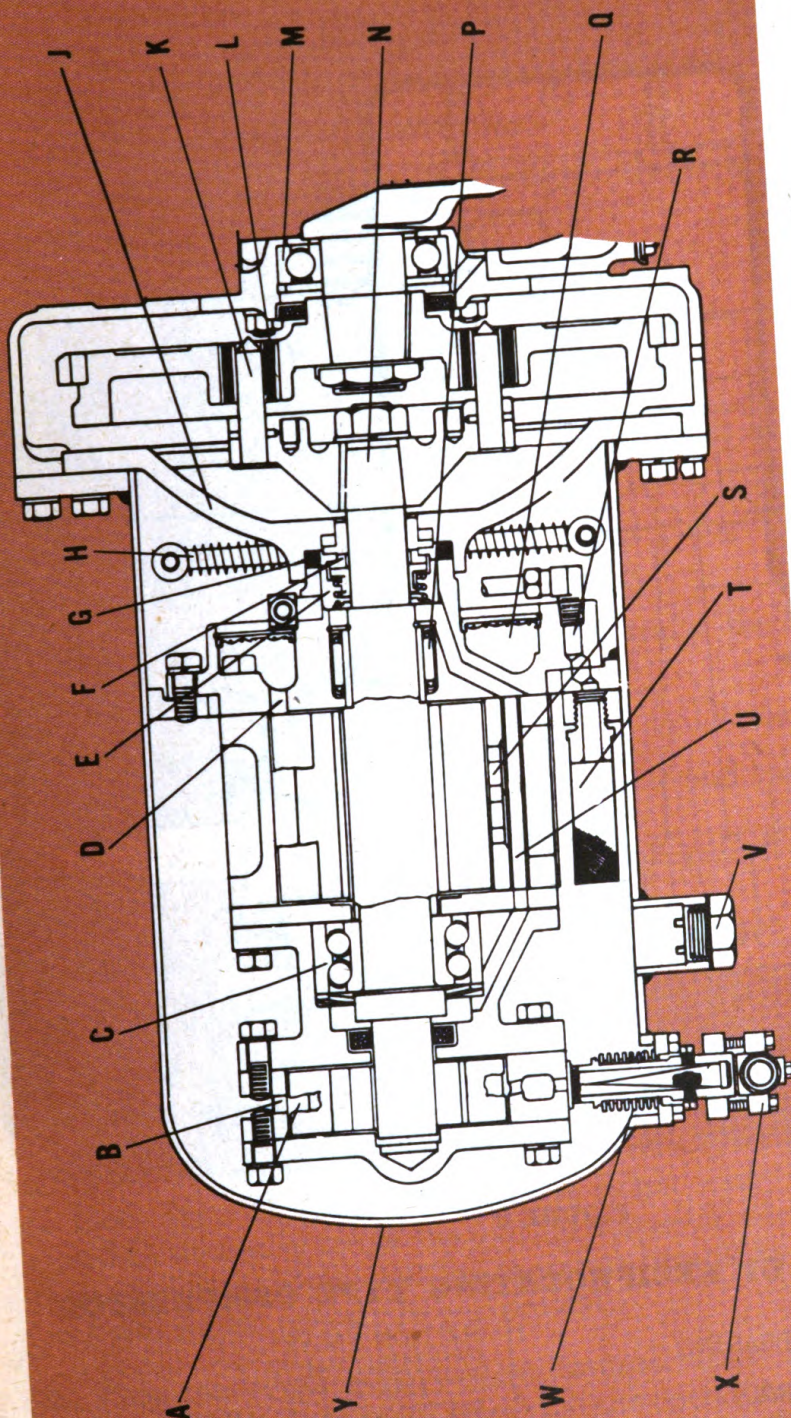


FIGURE 8

CROSS-SECTION OF ROTARY COMPRESSOR

A—Second stage rotary compressor large clearance—intake side. B—Intake ports of second-stage compressor. C—Double row rear ball bearings. D—Intake ports of first stage compressor. E—Front bearing and seal compartment. F—Refrigerant shaft seal. G—Front bearing and seal house packing. H—Fin-tube oil cooling line. J—Compressor outside front cover. K—Four-pin compressor drive coupling. L—Rubber bushing for coupling drive in engine flywheel. M—Engine rear main bearing. N—Compressor shaft. P—Front needle bearing. Q—Refrigerant intake screen. R—Lubricating oil passages. S—Discharge ports intermediate pressure. I—Lubricating oil strainer. U—Lubricating oil copper tube connection to rear bearing oiling passage. V—Magnetic oil drain plug. W—Flexible connection from high pressure discharge port to outside refrigerant line. X—High pressure refrigerant valve. Y—Drawn steel compressor housing shell.

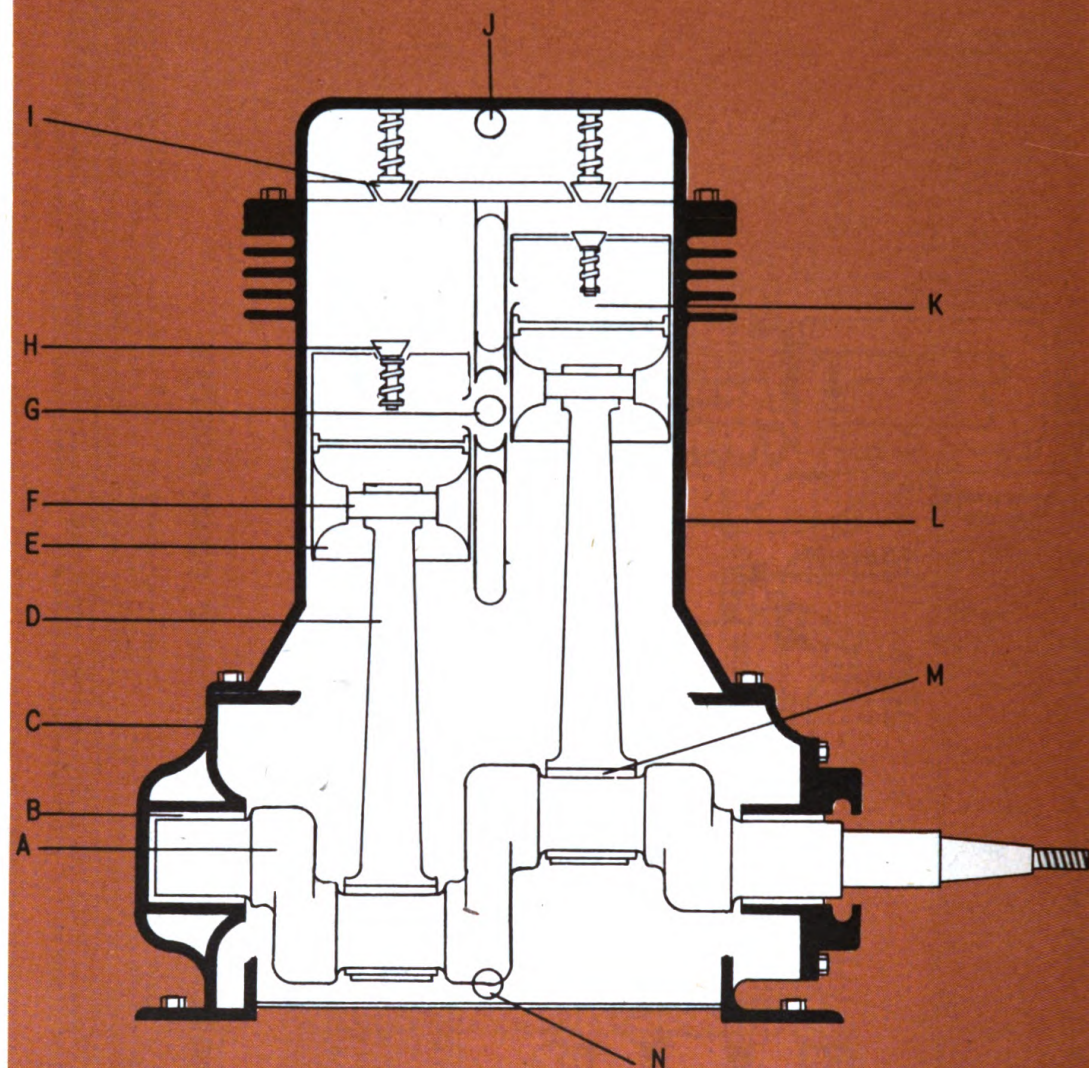


FIGURE 9

CROSS-SECTION OF RECIPROCATING TYPE COMPRESSOR

A—CRANKSHAFT
B—CRANKSHAFT BEARING
C—CRANKCASE
D—CONNECTING ROD
E—PISTON
F—PISTON PIN
G—SUCTION PORT

H—SUCTION VALVE
I—PRESSURE VALVE
J—DISCHARGE PORT
K—SUCTION GAS CHAMBER
L—CYLINDERS
M—CONNECTING ROD BEARING
N—OIL-LEVEL GLASS

15. SETTING UP THE MOBILE REFRIGERATION UNIT.

a. The tractor and semitrailer housing the refrigeration system are designed to operate as a unit when the following operations are performed in the order below:

- ①** Unlock king pin jaws in fifth wheel.
- ②** Back tractor up to the trailer until the trailer king pin is locked in fifth wheel jaws.
- ③** Connect brake hose to couplers on trailer.
- ④** Insert wiring plug into socket on trailer.
- ⑤** Raise landing gear wheels.
- ⑥** Replace landing wheel plates and chock blocks on carrying snaps provided.
- ⑦** Check and be sure that the fifth wheel plunger lock latch is in down position.

b. When disengaging the tractor from the trailer the following operations should be performed:

- ①** Place chock blocks in front and rear of trailer wheels.
- ②** Place landing gear wheel plates on ground and lower landing gear.
- ③** Close the air valves in the hose lines on tractor and disconnect both hose lines and jumper cable from the trailer.
- ④** Place hole couplings in the clips provided on the tractor.
- ⑤** Insert the dummy plugs on the trailer into the brake line couplers.
- ⑥** Unlock the coupler jaw on the fifth wheel and drive the tractor away from trailer.

c. The refrigeration unit is designed specifically for the transportation of food. Nevertheless, circumstances might easily develop when it would be necessary to use the unit for storage of perishable food. Only through diligent study will the operators be able to solve many problems which field operations will present.

d. Poor roads will often present transportation difficulties and the drivers must be thoroughly trained in the operation of a tractor-trailer unit. Safe arrival of foods is as important to the maintenance of a force in the field as the delivery of ammunition.

e. In many instances the load carried in the unit will be of a mixed nature. This is not the ideal procedure and operators will find it necessary under those circumstances to use their best discretion in adjusting temperatures low enough to preserve all products, yet not low enough to damage those which should not be frozen. Supplement No. 1 to Circular letter No. 291, OQMG (1941), contains lists giving the maximum storage periods for various products at various temperatures.

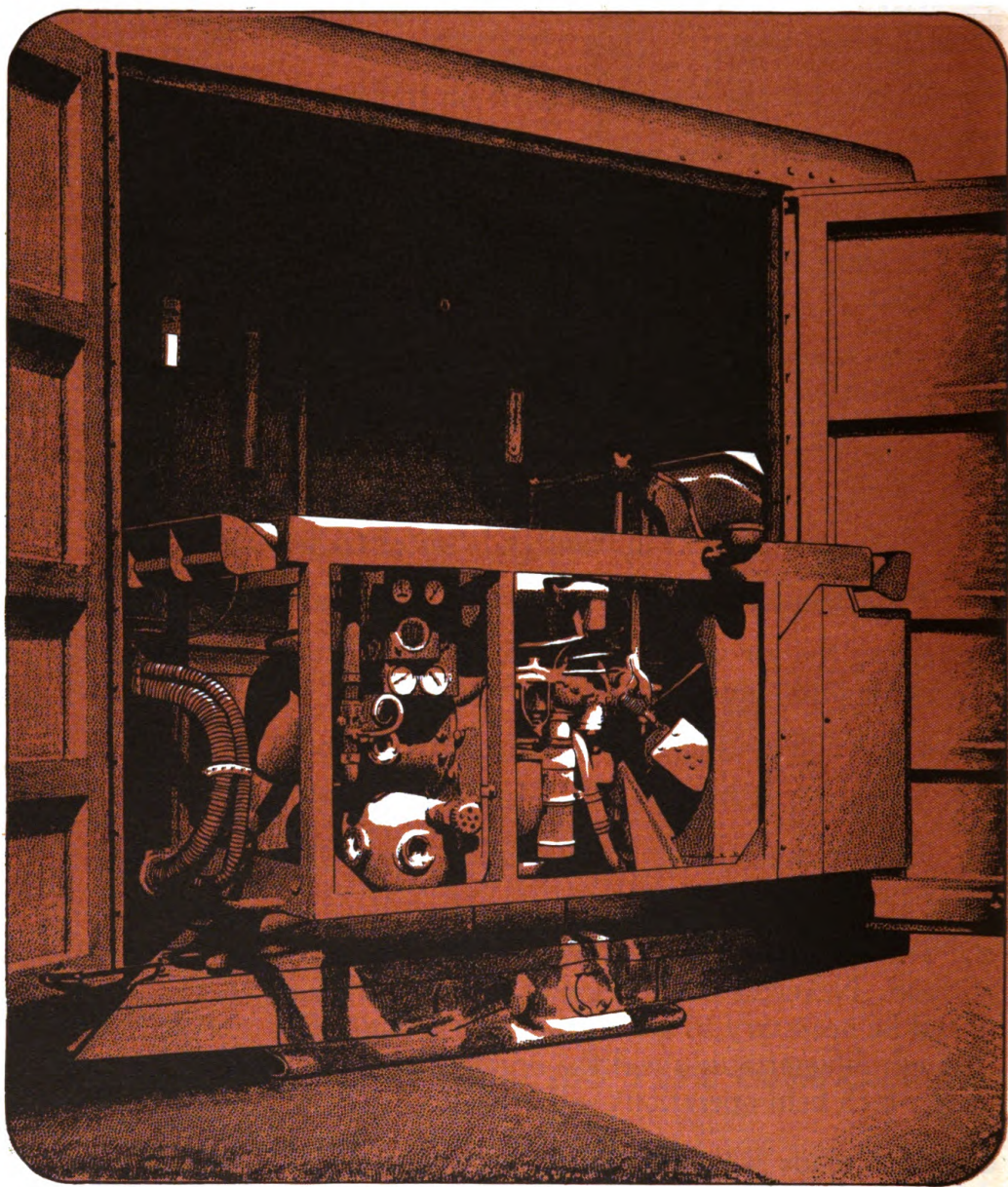


FIGURE 10
COMPRESSION UNIT REMOVED FROM THE TRAILER

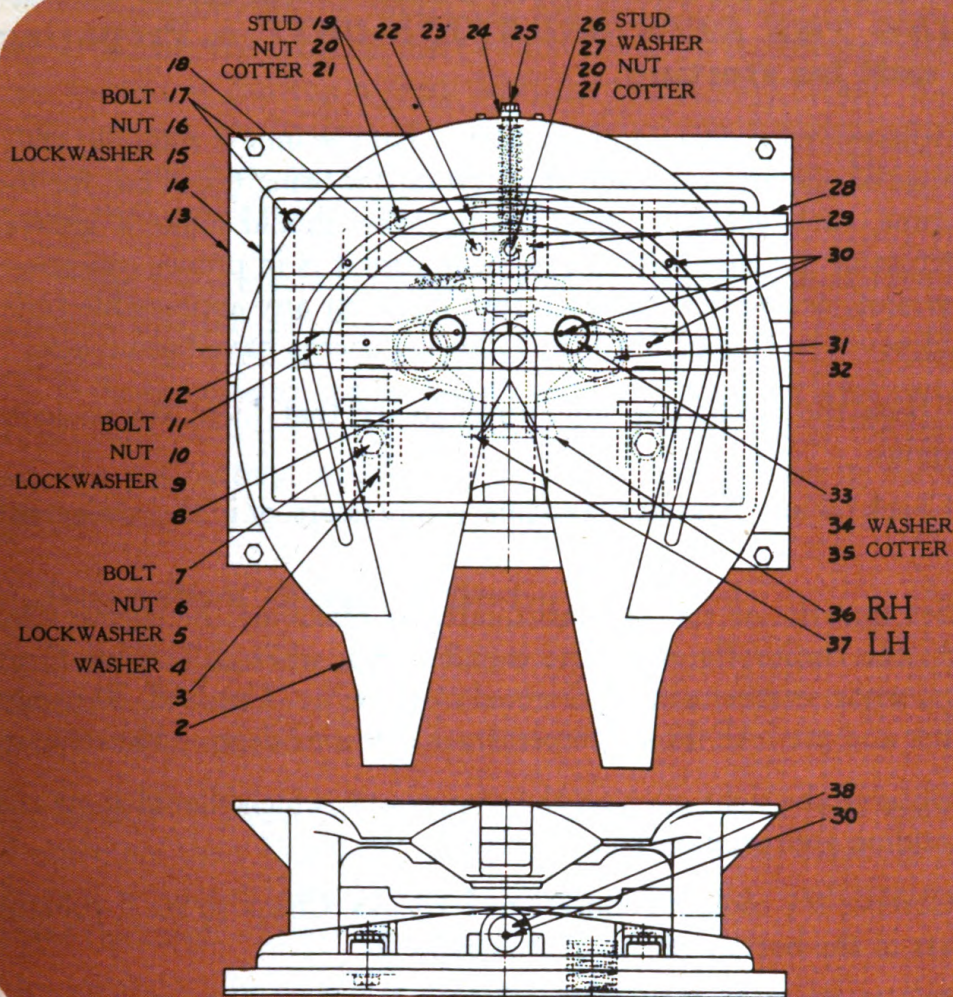


FIGURE 11
FIFTH WHEEL

- | | |
|---|--|
| 2. Base | 20. Slotted hex. nut |
| 3. Adjusting wedges | 21. Cotter pin |
| 4. Washers, adj. wedge | 22. Plunger safety latch |
| 5. Lockwasher | 23. Lock plunger spring |
| 6. Nut | 24. Plunger lock latch |
| 7. Adjusting wedge bolt | 25. Shoulder bolts |
| 8. Walking beam | 26. Stud, plunger |
| 9. $\frac{3}{8}$ " lockwasher | 27. Flat washer, $\frac{9}{16}$ " I.D. 2" O.D. $\frac{1}{2}$ " thick |
| 10. $\frac{3}{8}$ "-16 thread nut | 28. Operating handle |
| 11. $\frac{3}{8}$ " x $3\frac{1}{2}$ " 16 thread bolt | 29. Lock plunger |
| 12. Supporting bracket shaft | 30. Grease fittings |
| 13. Mounting plate | 31. Leveling springs |
| 14. Sub-base | 32. Leveling spring washer |
| 15. Lockwasher | 33. Coupler jaw pins |
| 16. $\frac{5}{8}$ "-16 thread hex. nut | 34. Washer |
| 17. $\frac{5}{8}$ " x $1\frac{3}{4}$ "-16 thread hex. bolts | 35. Cotter pins |
| 18. Lock latch spring | 36. Right hand coupler jaw |
| 19. Lock stud | 37. Left hand coupler jaw |
| | 38. Lateral shaft 2 x $10\frac{1}{8}$ " |

16. INSTRUCTIONS FOR STARTING AND OPERATING THE REFRIGERATION UNIT. a. Preparing the unit for starting.

Regardless of conditions, and whether or not the unit is running, when a change of operation is made or a new unit is being taken out for the first time, each operator, upon taking over, should make a general inspection of the entire system to make sure it is in proper condition. A new unit, or one that has been shut down for any appreciable time, should never be started until the following checks have been made:

- 1** Check the mechanical mountings to see that there are no loose fastenings.
- 2** Check for any leaks at the engine, compressors, or in the refrigerant lines.
- 3** See that the oil supply is adequate, by removing the engine filler cap on the carburetor side. The engine sump, when full, holds three quarts, while another pint is retained in the filter. Use SAE 30 in hot weather and use SAE 10 at temperatures below 32 degrees Fahrenheit.
- 4** Observe the sight glass on the compressor, which should show the oil standing approximately in the center.
- 5** Observe the coolant connections for leaks. Check to see if coolant appears in the bottom of the filler gooseneck.
- 6** Check the fuel supply. The unit at full load and running continuously will consume an average of four quarts of gasoline per hour.

b. Starting the unit.

After the preparation and inspection duties have received careful attention the unit may be started as indicated below:

- 1** To start the unit, lift the toggle switch to the "on" position. This will start the unit by means of the automatic Startix switch and starting motor. If the starting motor does not begin to crank the engine at once, it is because the Startix energizing circuit is open at the thermostat. The body temperature may be down. If so, leave the switch in the "on" position and wait for the temperature to rise, or manually adjust the thermostat to close the circuit. Don't forget to return the thermostat to the proper temperature setting after this adjustment.

② If the thermostat is closed and the starter refuses to crank the engine, inspect the cranking limit switch and see if the square moulded reset button at the top is flush with the round switch case. If it is projecting out of the case, remove the protecting housing with the glass in it and press the reset button down until it latches. The starter should then crank the engine.

③ If the low pressure switch is making poor connection, it should be examined and the contacts cleaned.

④ If the thermostat, toggle, low pressure, and cranking limit switches are all closed and the starter fails to respond, the cause of the trouble may be: low battery, struck Bendix, faulty Startix, loose or corroded connections.

c. Inspection after starting.

To make sure that the unit is functioning normally after it has been started, and that its operation can be left to automatic control, the meters and gauges should be observed as follows:

① Engine Oil Pressure Gauge. This gauge should read not less than 15 nor more than 35 after its temperatures have been stabilized. Stop the unit at once if the engine oil pressure gauge does not respond, and locate the trouble before starting again.

② Refrigerant "Low Side Gauge." As soon as the unit starts, the low side gauge will begin to fall. It can safely drop to 0 pounds. If it falls below 0, stop the unit at once and correct the trouble before restarting.

③ The Ammeter. This should show maximum charge for a few minutes directly after starting. After the unit is in operation for fifteen minutes to half an hour, it should taper off to meet the battery's charge requirement.

④ The Thermostat Setting. This should be observed to make sure that the automatic operation is set for the temperature desired.

d. Pumping a vacuum on an empty system.

1. Remove pipe plug from the compressor case and pour in one quart of dehydrated refrigerant oil of SAE No. 60 viscosity.

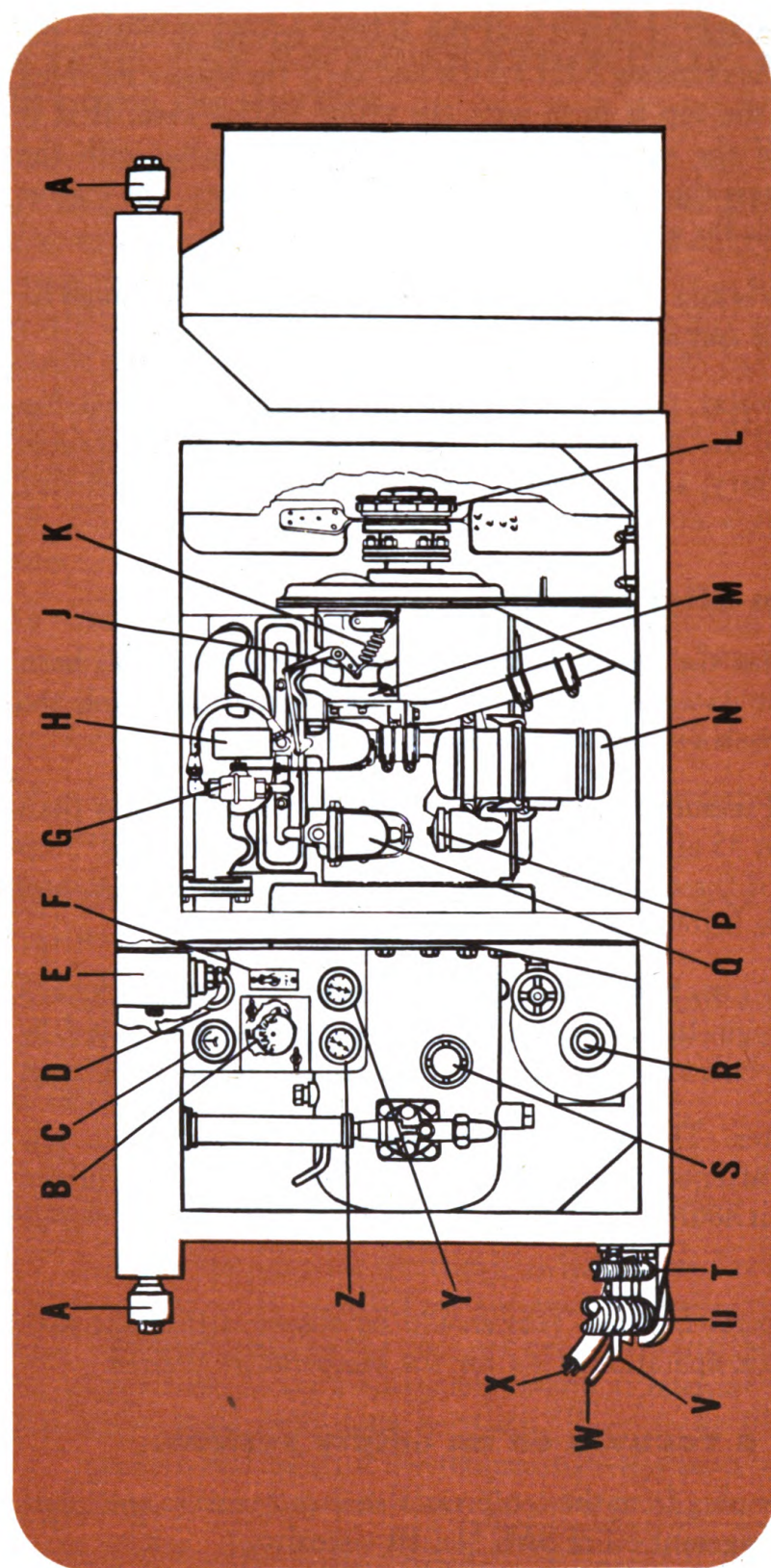


FIGURE 12
OPERATING SIDE OF TRUCK-TYPE ICE ENGINE

A—Rubber bushed wheel. B—Toggle "start-stop" switch for manual operation. C—Automatic electric choke. D—Engine oil pressure gauge. E—Safety switch; stops engine when refrigerant pressure drops too low. F—Toggle "start-stop" switch for manual operation; thermostat in body starts and stops unit automatically when this switch is "on." G—Governor speed control spring. H—Governor operating lever. I—Fuel supply pump and strainer. J—Spring loaded fan hub mounted on crankshaft. K—Refrigerant level sight glass in receiver. L—Coolant pump. M—Oil bath air cleaner. N—Engine oil filler with oil level dip stick. O—Fuel supply pump and strainer. P—Refrigerant level sight glass in receiver. Q—Low pressure refrigerant line; flexible. R—Flexible fuel line. S—Pilot light twin wire cable. T—Control and power cable. U—Refrigerant low pressure compound gauge on suction side. V—Refrigerant high pressure gauge on "high side."

2. Replace plug and close the case.
3. Connect a separate vacuum pump to the plugged opening in valve 1, Figure 13.
4. Open the valve just a crack and start the pump.
5. Open valves 2, 3, and 4, and run the portable vacuum pump until the compound gauge shows 28-30 inches of vacuum and holds it without further discharge of air from the vacuum pump.
6. Close valve 1. The system is now ready to receive a charge of refrigerant.

e. Charging the system with refrigerant.

1. Connect the Freon drum to compressor valve 1, Figure 13.
2. Close valve 4 and open valve 1.
3. Open the valve on the Freon drum $\frac{1}{2}$ to 1 turn.
4. Start the ice engine and continue to operate it until the Freon level is even with the top of the bull's eye in the receiver.
5. Close the valve on the Freon drum and valve 1.
6. Disconnect the Freon drum.
7. Open valve 4. When this valve is open, the Freon level should drop approximately to the center of the bull's eye during the operation of the unit.

f. Pumping down the system.

1. Close valve 4, Figure 13.
2. Start the motor and run it until the compound gauge shows zero.
3. When the gauge shows zero (which means that all the Freon is in the receiver, the condenser, and the compressor) stop the engine at once. Then close valve 2, to lock the Freon in.
4. The low pressure side of the system may now be opened for repairs or adjustment.

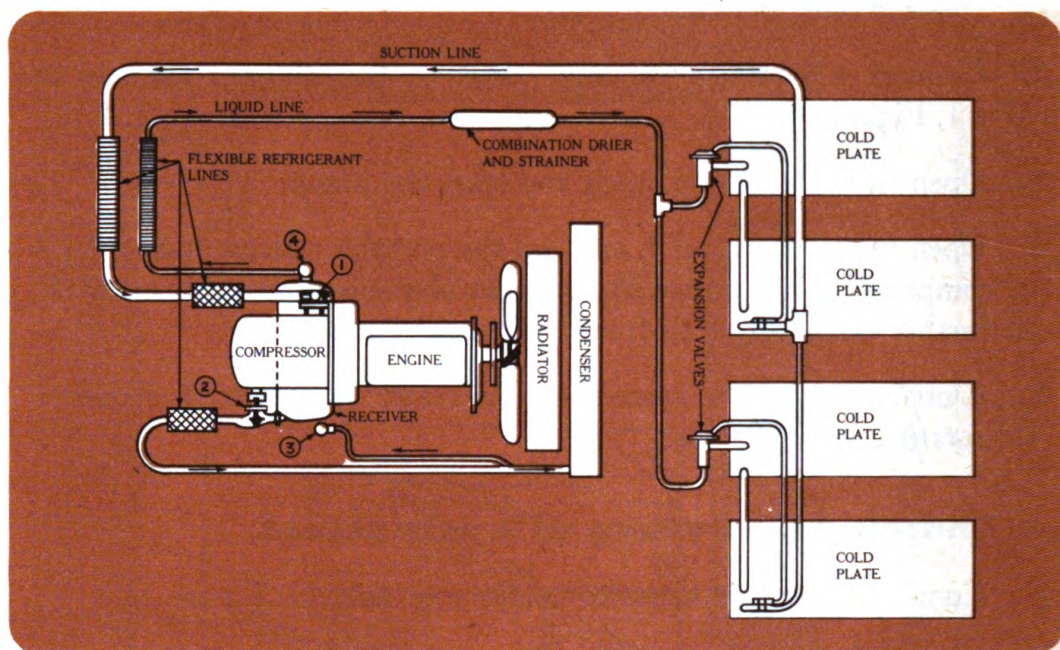


FIGURE 13
DIAGRAM OF REFRIGERATION SYSTEM—
MOBILE REFRIGERATION UNIT

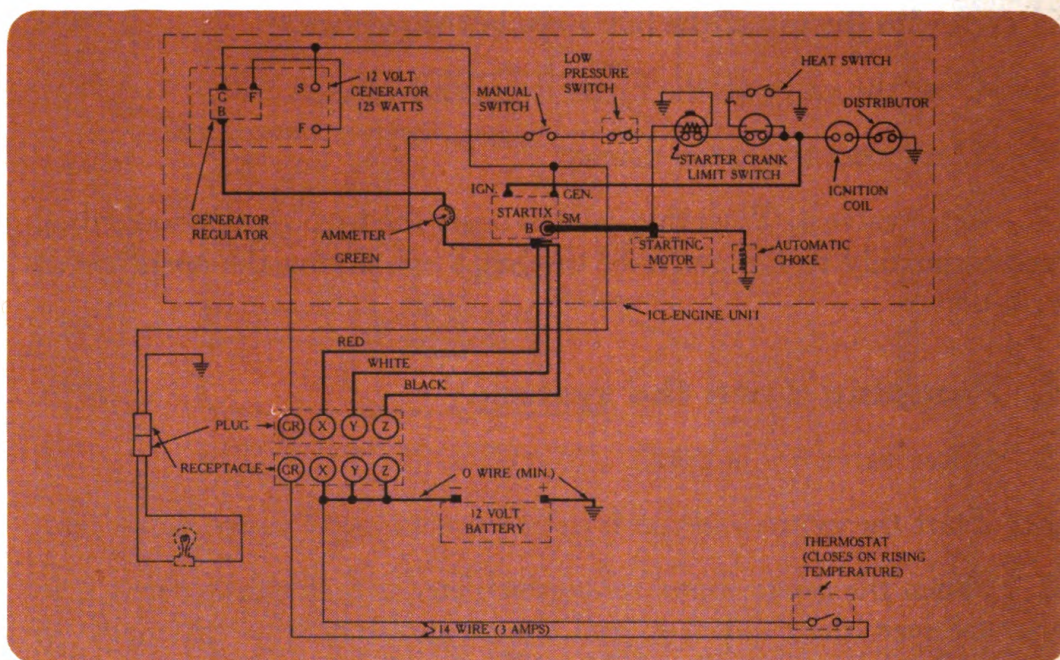


FIGURE 14
DIAGRAM OF WIRING SYSTEM—
MOBILE REFRIGERATION UNIT

g. Refrigeration temperature controls.

1. General. (a) White-Rodgers refrigeration temperature controls are designed for use on various cooling application of either fluid or air.

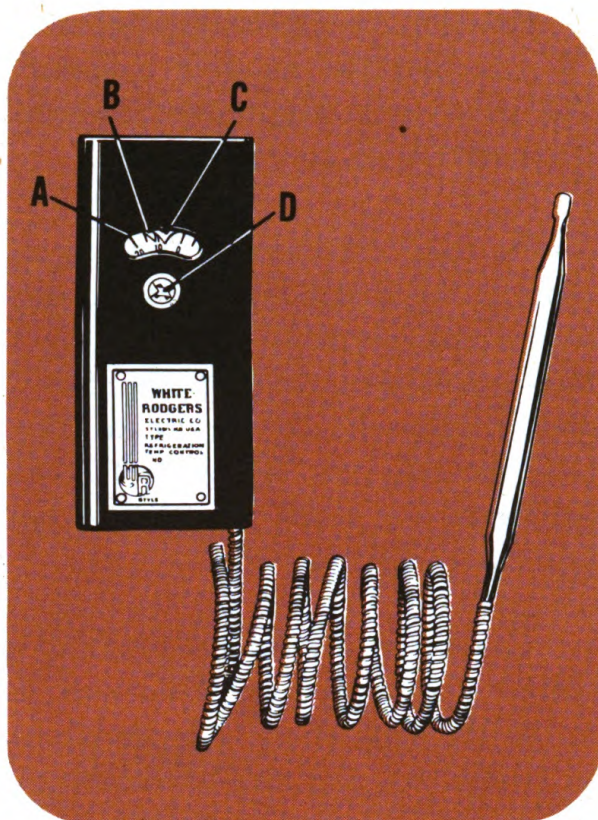
(b) The switch mechanism of this control may be mounted at any convenient location where the temperature and humidity will not cause a condensation on the contact mechanism.

(c) The bulb or sensitive element of the control should be located so as to be in an average temperature of the controlled area. A minimum amount of capillary should be placed in the controlled area and excess capillary should be coiled conveniently close to the switch mechanism.

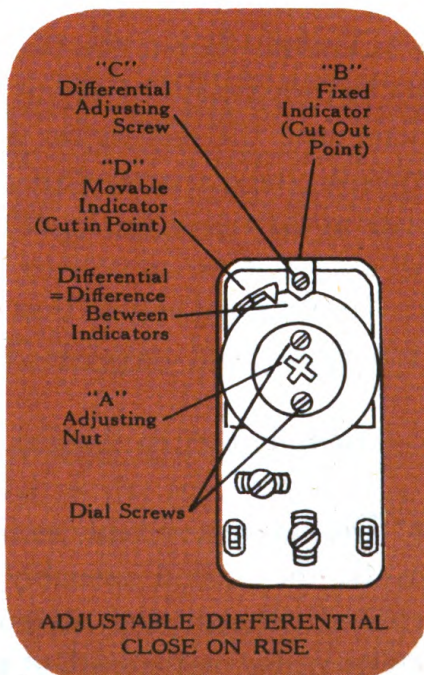
2. Setting the dial. (a) On adjustable differential refrigeration controls, the movable indicator points to the temperature at which the compressor starts, the fixed indicator points to the temperature at which the compressor will stop, and the difference between these two indicators will be the differential.

(b) To set the dial, proceed as follows:

1. Turn the dial so that the fixed indicator "B" points to the temperature at which the compressor is to stop.

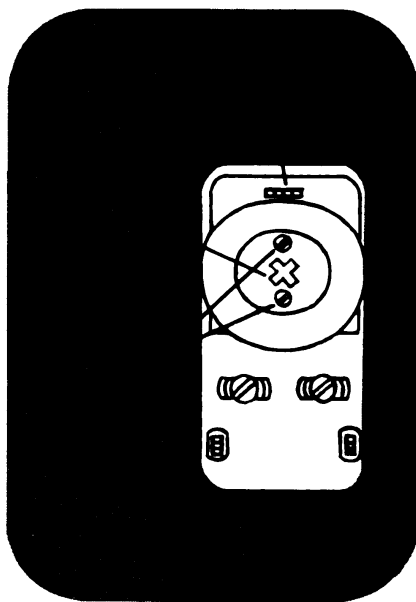


**FIGURE 15
THERMOSTAT FOR
TEMPERATURE CONTROL**



2. Turn the differential adjusting screw "C" so that the movable indicator "D" points to the temperature at which the compressor is to start.

(c) On fixed differential refrigeration controls, the fixed indicator "B" points to the temperature at which the contacts open, thus stopping the compressor. To set the control, turn the dial until the indicator "B" points to the temperature at which it is desired to stop the compressor.



3. Calibration adjustment. (a) This control has been accurately calibrated at the factory. If, however, due to the adaption of the control to the application, or for any other reasons the control is very far off calibration, it may be recalibrated as follows:

1. Measure the temperature of an average position in the controlled medium when the compressor just stops.

2. Carefully loosen the two dial screws. (See figure 15.) Be careful not to turn the adjusting nut during this or any of the following operations until the dial screws are again tightened. (On knob adjusting controls, the dial screws are made accessible by removing the chrome plate in the end of the knob.)

3. Turn the dial only so that the fixed indicator points to the temperature measured at operation "I."

4. Carefully tighten the dial screws.

(b) Do not remove the sensitive element from the control, or dismantle the control assembly, as this destroys the calibration. The sensitive element and control assembly is held together by the 4 screws visible on the back of the control.

CHAPTER IV

FIELD OPERATIONS

	Paragraph
General	17
Functions of the company during combat.	18
Company administration during combat	19
Traffic circulation and control	20
Decentralization of control	21
Special considerations of various types of engagements	22
Sanitary measures	23
Protective measures	24
Loading for distribution.	25
Conservation of refrigeration	26
Inspection of supplies	27
Loading capacity	28



17. GENERAL. a. This company has an important function to perform in supply operations. Although its operations are very similar to those of the quartermaster truck company, the supplies which this company will handle are perishable class I items. A complete discussion of supply in the theater of operations will be found in FM 100-10, Field Service Regulations, Administration; FM 10-5, Quartermaster Operations; FM 10-10, Quartermaster Service in the Theater of Operations; and FM 17-10, Armored Force Field Manual, Tactics and Technique (for special considerations in connection with supply of the Armored Force).

b. The perishable items transported by this company are components of field ration A.

c. The company operates between advance depots and division supply points, and is under the general direction of the regulating officer. These installations and their functions are described in FM 10-5, FM 10-10 and FM 100-10.

d. Class I supplies (rations) are called for by means of a daily telegram which gives the strength of the command in men and animals.

Divisions and corps (for corps troops only) prepare and send to army the daily telegram pertaining to their respective units. Army prepares a consolidated daily telegram, including provision for army troops, and dispatches it to the regulating officer. The regulating officer notifies the designated depots to prepare the shipments. Trains or trucks are dispatched and shipments are sent forward to railheads or truckheads according to schedules prepared and orders issued by the regulating officers. As indicated in paragraphs 1 and 2, the function of the quartermaster refrigeration company, mobile, is to enable the regulating officer to effect the delivery of perishable components of field ration A when this ration is being issued and refrigerator cars are not being used.

18. FUNCTIONS OF THE COMPANY DURING COMBAT. **a.** The general functions of the company have been discussed in paragraph 2.

b. The company is a part of army reserve. Platoons or sections are assigned to regulating officers and are controlled by them.

c. Table of Organization 10-247 provides for thirty (30) semi-trailers, of two-wheel van type, refrigeration. The company consists of company headquarters and three platoons. Each platoon consists of three sections. One refrigeration unit is assigned to each platoon headquarters, and three to each of the sections. Each unit is transported by means of a 4- to 5-ton tractor truck. It is intended that each section should supply one division with fresh meats or other perishables. The normal method of operating is for one empty unit to be enroute from supply point to the base, while a loaded unit is enroute from base to supply point, and while the third is distributing perishables. The number of units actually assigned for the supply of one division is governed by the distance from the base to the supply point or points. Several sections or units are ordinarily held in reserve to supplement the service of the regular operating sections.

19. COMPANY ADMINISTRATION DURING COMBAT. **a.** Under combat conditions, the quartermaster refrigeration company, mobile, may be broken up into its three platoons. One or more platoons may be broken up into sections. As indicated in paragraph 18*b*, platoons or sections are assigned to regulating officers and are controlled by them. At such times the distance between these subordinate elements and the company headquarters will often be great. Company administration will be extremely difficult if the company is to account for itself as a company when the several platoons

and sections are detached for duty during combat. For purposes of administration, therefore, a platoon or a section which is assigned to the regulating officer and controlled by him, will account for itself separately through the adjutant of the regulating station.

b. Any elements of the company which remain in the army reserve are accounted for by the company commander through the army unit personnel section (paragraph 14c, AR 345-5.)

c. Company forms and reports listed in paragraph 13a, AR 345-5, will be administered for the most part by the company headquarters section for only such periods of time as the company is together. When platoons are detached for duty, the forms and reports referred to above will be separated and sent with the proper platoon. Each Soldier's Qualification Card (Form No. 20), Service Record (Form No. 24), and any other papers deemed necessary will be transferred (as the commanding general of army may direct) from the unit personnel section of the army to which the company is assigned to the unit personnel section to which the platoon is attached.

d. A separate Morning Report and Daily Sick Report will be maintained by each platoon, and will be submitted daily to the designated unit personnel section referred to above. Each platoon will keep a separate Daily Roster, and will maintain its own individual clothing and equipment records. The platoon will draw supplies from the properly designated source at army headquarters through its own company supply officer.

e. Payrolls for each platoon will be prepared by the designated unit personnel section on the basis of information contained in service records and extracted daily from the Morning Report. (Such records as Council Book and Property Book are to be retained by the commanding officer of the company.)

f. Each platoon commander, when the platoon is separated from the company, will function somewhat as a company commander in administrative matters. He may act as agent officer, and may certify on platoon payrolls as the witnessing officer to payments. He will authenticate Morning Reports and any other papers the platoon may be called upon to prepare.

g. The problems of company administration during periods of combat may be summarized as follows:

- ①** Individual records of a static nature will remain with army personnel section to which the company (as a company) is permanently assigned.
- ②** Individual records of a less static nature, designated by AR 345-5 as records to be kept by a unit personnel section, will be transferred to the unit personnel section of the regulating station to which the platoon is attached.
- ③** Company records of a static nature, such as files and correspondence, company orders, memorandum receipts for property carried by the platoons, files of old requisitions, etc., will remain in the company file. When necessary, such records may be withdrawn for use by the platoon. When transfer of such records and information between the company and the platoon is imperative, it will be accomplished by messengers operating between the regulating stations and army headquarters. Normally, however, the use of reference slips, telephone calls, etc., simplifies administrative procedure, and should be resorted to in most instances. Adjustment and coordination of administrative matters may be accomplished when the company reassembles as a company.
- ④** As has been stated above, the company Morning Report and Daily Sick Report will be submitted by each platoon separately to the designated personnel section of the regulating station with which the platoon is operating. When company headquarters calls for information from these records, it may be extracted and forwarded by messenger or some other means of communication.

20. TRAFFIC CIRCULATION AND CONTROL. a.

It should be remembered that the operating units of this company cannot operate over all terrains. When loaded, they will probably use main supply roads. When empty, they will probably return over secondary roads. The units, however, are capable of operating loaded over secondary roads if necessary.

b. Army, corps and divisions will have a coordinated traffic circulation plan. The regulating officer will control the movement of sections of the platoons to the railhead or truckhead from which the traffic circulation and control plan operates. From that point forward the coordinated traffic circulation and control plan of the division governs the movements of units when going forward loaded. The reverse is true when the units return empty.

21. DECENTRALIZATION OF CONTROL. Platoons or sections are assigned to regulating officers and controlled by them. The company commander regains control only after they are released by the regulating officers. While platoons or sections are in transit under the control of regulating officers, the corps and division commanders have no control over their movements except as indicated in paragraph 20b. These platoons and sections operate as agencies of the regulating officer.

22. SPECIAL CONSIDERATIONS OF VARIOUS TYPES OF ENGAGEMENTS. Officers of the quartermaster refrigeration company, mobile, should be familiar with various types of engagements and their effects upon the activities of the company.

a. Types of engagements. There are several principal types of engagements. A discussion of these will be found in FM 100-5, Field Service Regulations, Operations. A study of the various types will help to prepare commanding officers of companies and platoons to take measures for their defense.

b. Special considerations in the supply of armored divisions. See FM 17-50, Logistics.



23. SANITARY MEASURES. No food should be loaded into the trailers of this company unless the interiors are in a sanitary condition and the mechanisms are functioning properly. The platoon and section leaders are responsible for making certain that the interiors of these trailers are scrupulously clean. The use of hooks in handling foods should be prohibited.

24. PROTECTIVE MEASURES. **a.** Each driver and the refrigeration mechanic accompanying him should be on the alert for the alarm signal indicating failure of the refrigerating unit to reduce the temperature to the point desired. This signal is visible from the cab.

b. Heavier items should be loaded on the bottom to prevent crushing of containers and the consequent bruising of their contents. Where it is desirable, the heavier items should be placed in one part of the trailer and the lighter items or containers placed in another.



c. When it is necessary to set up the trailer off the road, it should be so placed that it may be returned to the road without backing or turning. This may necessitate backing the trailer into position. Care should be taken that the route of exit selected will not be sufficiently impaired by rain or snow to prevent its use.

d. If these trailers are subjected to gas attacks or shelling, the following measures should be taken before the trailers are opened:

1 After a chemical attack, every vestige of chemicals should be removed before the doors are opened. The officer or noncommissioned officer in charge should first identify the chemical used, and then apply the specified neutralization agent. The doors should not be opened until this has been done, because perishable foods quickly become inedible if they are contaminated by chemicals.

2 If the trailers are subjected to shelling or other gunfire from heavy caliber weapons, efforts should first be made to discover whether toxic agents have been carried by the shells. If they have, the measures indicated in (1) should be taken. When explosives only have been used

and the walls or the roofs of the trailers have been penetrated, careful scrutiny must be given containers before distribution.

25. LOADING FOR DISTRIBUTION. a. In TM 10-610 will be found general instructions for loading details at the class I depots. Items will be unloaded at divisional supply points in accordance with plans made known to officers or noncommissioned officers in charge of platoons or sections. Care should be taken to segregate lots of mixed perishables according to prospective supply points.

b. In transferring supplies from cold storage rooms to cars or trucks, it is essential that clothing and equipment be scrupulously clean.

c. Care must be taken in handling refrigerated supplies to prevent their exposure to an amount of heat which would result in any deteriorating influence.

d. Refrigerator trucks should be properly iced and pre-cooled prior to loading; temperatures should not be higher than those which will exist in the refrigerator car or storage plant from which supplies are to be moved.

e. In loading refrigerator trucks, it should be kept in mind that one or more of the vehicles carrying a division's perishables may be lost and it is recommended that proper distribution of items be made accordingly.

f. Mixed loads of perishables should be loaded in the inverse order of their removal, provided there is more than one unloading point.

26. CONSERVATION OF REFRIGERATION. Under no circumstances should the doors of the trailers be opened except when necessary to load, unload, or clean the interiors. When perishable items are being distributed doors should not be kept open longer than necessary. All preliminary arrangements for the distribution of items at divisional distributing points should be made before the doors of the trailers are opened.

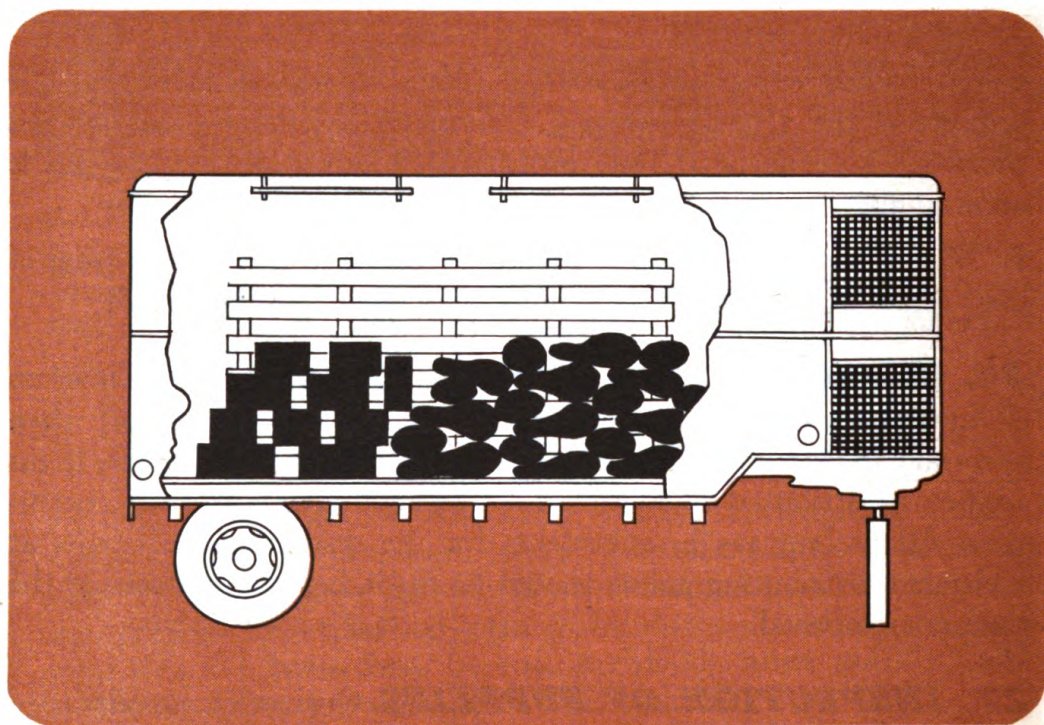
27. INSPECTION OF SUPPLIES. Ordinarily, supplies need not be inspected by any personnel of this company. The personnel of the quartermaster refrigeration company (T/O 10-217) performs this work at the class I depots (or at other fixed refrigeration installations). The details of inspection will be found in TM 10-610.

28. LOADING CAPACITY. a. The trailers have approximately 470 cubic feet of space available for loading. This is net capacity determined after deduction of 1.5 feet of headspace for cool air circulation, and deducting space consumed by the refrigerating mechanism.

b. The maximum allowable payload for these trailers is 10,000 lbs.; although there will be space for a much heavier load. For example, if one cubic foot of frozen boned beef weighs 50 lbs., the trailer could carry 23,500 pounds, which is more than double the allowable load. Such a load should never be carried.

c. Assuming an average weight of 20 pounds per cubic foot, a trailer may transport 9,400 pounds, or approximately 5 tons of produce. When such a load is carried, protective slatted racks should be used to prevent any items from contacting any part of the refrigerating mechanism.

d. On the basis of a 5-ton capacity of perishable subsistence items per trailer, a total of 30,000 pounds could be transported by each trip of the three trailers. Such a trip would supply two pounds of perishable items for each man of a 15,000-man division.



LOADED REFRIGERATION TRAILER

Loads should be evenly distributed over bed of trailer, and arranged to permit free circulation of air.

CHAPTER V

SUPPLY AND REPLACEMENT OF EQUIPMENT

	Paragraph
Initial issue.	29
Replacement items	30
Individual clothing and equipment	31
Forms used in requisitioning	32



29. INITIAL ISSUE. Upon activation of the company, the commander will obtain the complete allowance of all authorized items automatically and without requisition from the appropriate post, camp or station supply officer. (Letter OQMG, April 15/42, File QM 320.3 D-Q-E.)

30. REPLACEMENT ITEMS. After the initial allowance of equipment has been issued to the company, the company commander will obtain replacement (except for individual clothing and equipment) of the following articles as follows:

a. Expendable articles. 1. By direct exchange of the unserviceable article on presentation to the appropriate supply officer.

2. By requisition for expendable spare parts, tools, etc., accompanied by a certificate stating that the articles are required to complete an authorized set, or to replace those which cannot be presented for exchange for reasons stated.

3. By requisition for supplies issued on an allowance basis.

b. Nonexpendable articles. 1. On presentation of a complete voucher covering the articles to the station property officer (through either the unit supply officer or custodial officer or both of them). Such vouchers may be a Statement of Charges, an approved Report of Survey, or a quarterly Dropping Allowance Certificate.

2. By direct exchange of unserviceable articles or component parts thereof, accompanied by a certificate that the unserviceable condition is due to fair wear and tear. If the station property officer is not satis-

fied that the unserviceable condition is due to fair wear and tear, he may require that the certificate be approved by the commanding officer. (AR 35-6540.)

3. (a) Repair materials will be issued on requisitions certified to the effect that the material requisitioned will replace material used in the repair of Government property. Tools and parts not included in repair sets will be exchanged in the same manner, provided the organization has facilities to install such parts; otherwise, they will be installed by the supply arm or service concerned.

(b) Nothing in the foregoing prescribed method of replenishment of equipment will be construed as sanctioning periodic allowances or limiting in any way the number and amount of spare parts that are to be exchanged. The purpose is to provide parts for the maintenance of the authorized allowances of equipment. Damaged parts presented for exchange will be exchanged regardless of the number included in the set, provided the total number of spare parts or tools authorized to be on hand in any organization is not exceeded. The accumulation by organizations of stocks of spare parts, repair materials, and tools in excess of allowances is prohibited.

31. INDIVIDUAL CLOTHING AND EQUIPMENT.

Individual enlisted men will arrive with clothing and equipment prescribed in AR 615-40. Additional items to complete the total allowance will be drawn on requisition to the post quartermaster. Replenishment of clothing and equipment worn out by fair wear and tear will be made as prescribed in AR 615-40.

32. FORMS USED IN REQUISITIONING. a. Requisitions for supplies and equipment will be made on WD, QMC Form No. 400 (requisition) (except where other specific blank forms are prescribed for requisitioning particular classes of property) irrespective of the source whence the property is to be obtained and irrespective of the character of the property requisitioned. The authorized exceptions are as follows:

- ① WD, AGO Form No. 35—Individual clothing slip.
- ② WD, QMC Form 409—Requisition and receipt for clothing in bulk.
- ③ WD, QMC Forms 411, 412, 413, 414—Requisition and receipt for brooms, matches, stationery and office supplies, cleaning, and preserving material, china and glassware. AR 35-6540.

b. The method of preparing and submitting requisitions will be as prescribed in WD Cir. 405, 1942.

CHAPTER VI

OVERSEAS MOVEMENTS

	Paragraph
Initial procedure	33
Necessary records and rosters.	34
At port of embarkation	35
Command responsibilities aboard transports	36
At port of debarkation	37



33. INITIAL PROCEDURE. a. On receiving warning orders or an alert that the company will proceed to a port of embarkation for overseas duty, company officers must institute immediate and vigorous action to complete all unfinished company and personal business and prepare their organization for the move.

b. Show-down inspections should be held to discover whether the enlisted personnel have all the prescribed clothing and equipment. Excess items should be returned to the proper agencies. If the company has items in quantities which are less than prescribed allowances they should be requisitioned and obtained as quickly as possible.

c. Post property will be turned in and credit memorandum receipts obtained. If a custodial officer handles post property, he is responsible for the administrative details involved in returning it.

34. NECESSARY RECORDS AND ROSTERS. a. The preparation of reports and rosters and the completion of permanent records affecting enlisted and commissioned personnel will usually be accomplished by the personnel section at the home station. In some instances, however, companies will not have personnel sections available and will be forced to perform their own administrative work. When a personnel section is available, most of the following administrative

work will be accomplished by that section; the company officers will be concerned with only as much of the detailed work as is specifically indicated or requested by the personnel officer.

b. Immunization records of enlisted men and officers should be checked as soon as it is known which vaccinations and inoculations will be required before embarkation. A list is prepared in quadruplicate, showing with each name the inoculations or vaccinations which must be completed. One copy of this list is held by the commanding officer of the company, and three are forwarded to the post surgeon.

1. A schedule is arranged with the surgeon for inoculations and vaccinations. A copy of this schedule is forwarded to the company commander.

2. The company commander is responsible for sending members of the company to the surgeon as stipulated in the schedule, and for providing a commissioned officer or responsible noncommissioned officer to take charge of any groups sent to the surgeon.

3. When the inoculations and vaccinations are completed, the surgeon so certifies on the three copies of the list provided him, and the officer or noncommissioned officer in charge of the group takes the duplicate copy to the personnel officer and the original to the company commander.

4. The surgeon retains the triplicate copy of the list. From it he completes the individual immunization registers and sends the originals to the personnel officer.

c. On the basis of the certified list forwarded by the surgeon, a certificate in triplicate is prepared in the following manner:

Company_____

Fort_____

Date_____

I certify that the records of Co._____ indicate that all members of this organization have been vaccinated against smallpox, typhoid, para-typhoid fever, and yellow fever as required by existing regulations, with the following exceptions:

<i>Name</i>	<i>Serial</i>	<i>Defect</i>	<i>Reason</i>
Doe, John_____	600000	No yellow fever vaccination	Not available

(signed) JOHN BLANK
Captain, QMC , Commanding

One copy of the certificate is forwarded to the surgeon at the port of embarkation; one copy is retained for presentation to the transport surgeon aboard ship; the remaining copy is retained for the file.

d. The immunization records in the enlisted men's service records should be completed from the immunization registers which the surgeon has prepared from the copy of the list mentioned in subparagraph *b* (4) above.

e. Arrangements are made to have all personnel of the company receive a physical examination within 48 hours before departure from the home station. The surgeon prepares a certificate stating that the examination has been completed, and forwards the certificate to the personnel officer. The personnel officer then forwards it to the surgeon at the port of embarkation. This certificate and the one relative to immunization (see subparagraph *c* above) should be forwarded together when practicable.

f. The personnel office prepares in quadruplicate on WD AGO Form 309 a complete roster of all officers and enlisted men accompanying the unit. All copies of this list are taken to the port of embarkation, one copy for delivery to the port personnel officer, and two for delivery to the commanding officer of the overseas discharge and replacement depot. The fourth is the file copy.

g. A typewritten roster is prepared in triplicate in the following manner:

① Names of officers and warrant officers are arranged according to grade.

② Names of enlisted men are arranged alphabetically according to grade.

③ After the names (listed in accordance with subparagraphs (1) and (2) above) must be shown the company to which each is assigned and the arm or service to which he belongs.

④ All three copies are taken to the port of embarkation and given to the officer in charge of the port. This should be done not more than 24 hours before embarkation, in order that the officer in charge of the port may make the necessary assignments to accommodations aboard ship.

h. Each individual is contacted to determine that the information on his emergency addressee card is authentic. The date of this verification and the initials of the interviewing officer are written on the card.

i. Before departure from the home station, the unit commander will report (by air-mail letter, radio, or teletype) to the port commander detailed information on the manner in which the unit and its equipment will move to the port of embarkation.

1. When the movement is made by rail the following information must be included in this report:

(a) Railroad routing.

(b) Date and hour of departure of each train section.

(c) Date and hour of scheduled arrival at the port of embarkation or appropriate railroad terminal (giving the name of such terminal) for each train section. (Efforts should be made to arrive during the morning hours in order to avoid movement through congested areas during the afternoon.)

(d) Number of officers and army nurses shown separately.

(e) Number of enlisted men and civilian employees (enlisted men alphabetically by grades, civilian employees by sex).

(f) Weights and cubic measures of baggage not required by troops during the voyage. Such baggage is to be classified by the type of container in which it is shipped. A report is to be forwarded in duplicate so that it reaches the port commander at least six days prior to the date and hour of sailing.

(g) Number, types and weights of all wheeled equipment.

(h) All other equipment should be reported separately in the manner indicated in (f) above.

2. When the movement is made by motor convoy or by marching, the following information should be included in the report:

(a) Route, place, date, and duration of long halts or bivouacs.

(b) Number of serials, number of vehicles in each, date and hour of departure, and the scheduled hour of arrival of each at the designated reception point.

(c) Number of officers and army nurses, shown separately.

(d) Number of enlisted men and civilian employees (enlisted men alphabetically by grades, civilian employees by sex).

(e) Number of pieces and types of wheeled equipment.

3. When the movement of freight is reported the following data should be included:

(a) Routing, rail and/or water.

(b) Car numbers, box or flat, and the general description of contents such as, "rations," "forage," "motor vehicles," etc.

(c) Expected time of arrival at the port of embarkation, or other designated unloading point.

(d) Bills of lading and shipping papers as prescribed in AR 30-955, AR 30-950, AR 30-945.

j. Reports should be sent direct to The Quartermaster General, showing a list of all organizational equipment with its markings, designations, weights, and cubic measurements.

k. Table of Basic Allowances organizational equipment and initial and maintenance supplies (except "hand" and "heavy" baggage accompanying troops) should be shipped in time to reach the port of embarkation not more than 72 hours before sailing time.

l. Cargo freight (including all types of vehicles shipped by rail or convoy) should be dispatched so as to arrive at the port of embarkation not less than three nor more than five days before the scheduled date of sailing. (Tools for vehicles will be boxed or otherwise secured in each vehicle.)

m. Records should be disposed of as authorized by the following War Department circulars: 203 of 1941, and 20, 34, 63, 89, 101, 132, and 152 of 1942.

n. All organizational and individual records that are not necessary for current administration purposes should be boxed by general classes and marked to indicate the unit to which they belong. Lists should be prepared in triplicate to show the location and contents of each box of records. The boxes are stored at the last permanent station, and the original and one copy of the list of such stored records are forwarded to The Adjutant General. The third copy is retained.

35. AT PORT OF EMBARKATION. a. Upon arrival at the port of embarkation, the company commander will make available to the port commander and his staff, such officers and enlisted men as may be required to serve as messengers, personnel clerks, advisers, etc.

b. Copies of the rosters indicated in paragraph 34f and g above will be delivered as indicated.

- c.** At least one company officer should be designated to accompany the organization to barracks or quarters.
- d.** Arrangements will be made with the commander of troops or the port commander (as the case may be) to furnish such guard details as he may request both prior to and after embarkation.
- e.** Arrangements will be made with the port surgeon for incompleting inoculations and vaccinations of personnel, and for any physical examinations which may be required by current regulations.
- f.** The company commander should learn the location of the transport's latrines, washrooms, water fountains, etc., and the regulations governing their use, in order that the company may be fully instructed in these rules before boarding the transport.
- g.** Instructions will be issued to the entire unit that:
 - 1.** It may be necessary to separate the troops from their hand baggage. Therefore, mess kits, toilet articles, underwear, socks, and similar items will be kept in the haversack and roll.
 - 2.** Working details sent ashore will be under the command of a commissioned or noncommissioned officer who will be responsible for checking the detail off and on the ship.
 - 3.** Immediately after the command is marched to the pier for inspection and check, the first guard detail for transport duty will be marched on board and posted under the direction of the new transport officer of the day.
- h.** At the hour prescribed in the embarkation order, the company will be marched to the pier in the order that names appear on the passenger list. To avoid delay and confusion, the company should be formed in this order several times before embarking.
- i.** The company commander must designate one of his commissioned subordinates to march the company on board and conduct it to its quarters. The company commander remains at the gangplank and assists in checking and verifying the company passenger list as members board the vessel.
- j.** The entire command must be ordered to remain in quarters until the company has completed the boarding operation and specific orders are given permitting members to leave quarters.
- k.** No members of the company should be permitted ashore unless they have been assigned to some work detail there.
- l.** The company commander presents to the transport surgeon the certificate of vaccination indicated in paragraph 34c above.

36. COMMAND RESPONSIBILITIES ABOARD TRANSPORTS.

a. A duly appointed commander of troops and a transport quartermaster or quartermaster agent will cooperate with the master of the transport and issue all orders governing the administration of troops during the time they are on the transport. Since the commanding officer of a quartermaster refrigeration company will very seldom be the commander of troops (usually a line officer) or a transport quartermaster, the manner in which the command is authorized to function need not be explained here.

b. Commanding officers of quartermaster refrigeration companies will cooperate with the commander of troops or other designated officer in every way possible.

37. AT PORT OF DEBARKATION. **a.** When debarking, each organization leaves the transport as a unit. One individual from each organization leaves the ship first and places the company standard at a point designated by a debarkation officer or his representative.

b. When debarkation is completed, roll will be called from the passenger list and verified by the debarkation officer. The debarkation officer then gives the commander of the organization a release from the pier stating that the organization has been satisfactorily checked.

c. Unless circumstances are exceptional, troops arriving on a ship which docks after 1800 will not debark until the following morning.

d. Each organization will usually be required to furnish the following work details prior to debarkation:

① A group to report to the police officer to clean up parts of the ship occupied by troops.

② A group to report to the supply officer to assist in unloading light baggage of officers and men, and camp equipage.

③ A group to report to the supply officer of the troops to unload ammunition and property.

e. The work details mentioned in paragraph *d* above leave the ship with the rest of the company and are then marched back to the ship to accomplish their specified tasks. The only exception to this procedure occurs when troops debark in small boats or lighters because the transport is unable to come alongside the wharf; fatigue details then remain on board until their work is finished.

APPENDIX A

ADMINISTRATIVE CHECK LISTS

PART I

MILITARY RECORDS

a. Company Records

Company Correspondence File	
Company Council Book	WD QMC 15
Company Morning Report	WD AGO 1
Company Orders	
Company Property Book	QMC 424 (rev)
Company Punishment Record	
Daily Sick Report	WD AGO 5
Driver's Report—Accident, Motor Transport	SF 26
Duty Roster	WD AGO 6
Enlisted Man's Pass	WD AGO 7
Exchange Order (optional form)	ExO-1
Individual Clothing and Equipment Record	WD AGO 32
Individual Clothing Slip	WD AGO 35
Individual Equipment Record	WD AGO 33
Report of Survey*	WD AGO 15
Requisitions	WD QMC 400, 409 411, 412, 413, 414
Statement of Charges*	WD AGO 36

b. Personnel Records. These are also required to be kept by the company when it is "separated" or "detached".

Abstract of Class "A" Pay Reservation Deductions (and ledger cards)	WD FD 54
Application for Family Allowances Class F Deduction (When prepared by individual soldier. See Part II, c)	WD AGO 625
Application for Pay Reservation for Purchase of War Savings Bonds Class "A" Pay Reservation	WD AGO 29-5
Certificate of Service	WD AGO 280
Charge Sheet for Courts-martial	WD AGO 115
Class D, E, and N Allotments; application, authorization, discontinuance, changes, etc.	WD AGO 29, 29-1 30 USVB 350, 724, 896
Consolidated Report of Classification in Arms	WD AGO 111
Correspondence and Files	
Descriptive List of Deserter from Army of the United States	WD AGO 45
Designation of Beneficiary; Certificate for Change in Address of Beneficiary or Next of Kin	WD AGO 41 WD AGO 42

*These forms are initiated by the company commander as the "responsible officer," but preparation is usually done by the personnel section.

Discharges (including Certificate of Disability for Discharge).....	WD AGO 40, 55 56, 57
Emergency Addressee and Personal Property Card.....	WD AGO 43
Extract from Service Record.....	WD AGO 25
Final Statement.....	WD 370
Furlough.....	WD AGO 31
Investigating Officer's Report—Motor Transport.....	SF 27
Notification of Discharge.....	WD AGO 39
Pay Rolls.....	WD 366 and 366a
Qualification Cards.....	WD AGO 20
Report of Apprehension or Surrender of a Deserter.....	WD AGO 46
Report of Death.....	WD AGO 52
Report of Desertion.....	WD AGO 44
(See Part II c.)	
Report of Individual Classification in Arms.....	WD AGO 110
Report of Physical Examination of Enlisted Man Prior to Discharge or Retirement.....	WD AGO 38
Report of Change and Rosters.....	WD AGO 303 and WD AGO 309
Request for Cancellation of or Change in Pay Reservation for Purchase of War Saving Bonds.....	WD AGO 30-5
Service Records (including inserts).....	WD AGO 24
Special Orders.....	
Statement of Account.....	WD AGO 27
Voucher for Pay and Allowances of Individual Enlisted Men.....	WD 337

PART II

COMPANY COMMANDER'S CHECK LIST

a. When activating a separate or detached company without assistance from personnel section.

1. Prepare Initial Roster..... AR 345-900, Par. 12
2. Submit Initial Report of Change..... AR 345-800, Par. 18
3. Initiate Morning Report..... AR 345-400
(Prepared by 1st Sergeant. Company Commander authenticates. Send to higher headquarters daily.)
4. Check Table of Organization..... AR 615-26
Requisition needed personnel
5. Initiate Company Property Book..... WD Cir. 405, 1942
6. Check Qualification Cards and Service Records
Assignments in accordance with qualifications..... AR 615-26

7. Company Orders
Appointment and reduction of privates, first class,
technicians and noncommissioned officers. AR 615-5
AR 615-10
8. Initiate Daily Sick Report. AR 345-415
(Prepared by 1st Sergeant. Company commander
authenticates. Send to unit surgeon with sick detach-
ment. 1 copy.)
9. Initiate Duty Roster. AR 345-25
(Prepared by 1st Sergeant. Company commander
supervises. 1 copy retained by company).
10. Company Fund
(a) Council Book. AR 210-50
(Prepared and kept by company commander, 1
copy, file voucher for each item, audited by com-
pany council each month.)
(b) Property list. AR 210-50
(c) Bank account
11. Company History. AR 345-105
12. Check Combination Equipment Chart and Requisition. OQMG Cir. Letter
(Chart covers all items and quantity thereof of in- 416, 11-20-42
dividual and organizational equipment to be initially
issued unit by all supply arms and services, except
individual clothing and equipment issued soldier at
reception center. Company commander will receive
copy of chart and will check with it against items
issued to secure fulfillment of issue provided thereon.)
13. Check Tables of Basic Allowances.
14. Check Table of Allowances No. 20 for issue of post
property.
15. Provide files for individual clothing and equipment
records and requisition deficiencies.

b. When taking over a company already formed.

1. Inventory of property and equipment.
(a) Property Book.
(b) WD AGO 32 and 33.
(c) Check with custodial officer on T/A property.
2. Transfer Unit Fund.
(a) Check Council Book.

- (b) Check company property list.
- (c) Transfer bank account.
- 3. Check roster of company against T/O.
- 4. Check Morning Report against roster.
- 5. Check Duty Roster.
- 6. Check Service Records and Qualification Cards.
(Commanding officers should know the qualifications and backgrounds of their men.)

c. After company is in existence, assuming assignment to personnel section.*

1. DAILY

- (a) Morning Report, WD AGO 1.....AR 345-400
- (b) Report of Change, WD AGO 303.....AR 345-800, chg. 1, 2
(Prepared by personnel officer, 3 copies. Original to machine records section. For individual officers, duplicate to Quartermaster General. For individual enlisted men, duplicate is not transmitted. For units, duplicate to Quartermaster General, except not forwarded when outside continental United States. Triplicate: for individual enlisted men and officers is retained in personnel section, for units to "Adjutant General, Returns Section, Miscellaneous Branch, Washington, D. C.")
- (c) Sick Report, WD AGO 5.....AR 345-415, chg. 1
- (d) Duty Roster, WD AGO 6.....AR 345-25
Publish duty details.
- (e) Company correspondence.....AR 340-15
Files.....AR 345-620
- (f) Company orders.....AR 310-50
Appointment to and reduction from Pfc.....AR 615-5

2. MONTHLY

- (a) Pay Accounts.....AR 345-155,
chg. 1, 2, 3, 4, 5
- 1. Pay Rolls.....AR 35-4520
(Prepared and authenticated by personnel officer in quadruplicate. Original and duplicate to the disbursing officer, triplicate for.....AR 35-5520
.....AR 35-1440
.....AR 35-2440

*Where company is "separate" or "detached" and is not assigned to a personnel section for administration, the company commander will assume the responsibilities detailed to the personnel adjutant. (See also Part III.)

- company records, quadruplicate sent to TAG in lieu of roster. It will be completed to show men who have ceased to belong to organization or who have been assigned between time of preparation of pay roll and last day of month.) AR 345-475
2. Voucher for Pay and Allowances of Individual Enlisted Men (WD 337).
- (b) Check and return roster from machine records unit.
- (c) Company council meeting. AR 210-50
Audit Council Book.
- (d) Ration Account of Morning Report. Par. 13a (6),
AR 30-2210
AR 35-4520
AR 345-400
(Prepared by the company commander to draw commutation of rations for men authorized to mess separately.) Pars. 35 and 40,
AR 345-400
- (e) Initiate new forms.
1. Morning Report. AR 345-400
2. Duty Roster. AR 345-25
3. Council Book. AR 210-50
- 3. QUARTERLY**
(a) T/BA requisitions } or as directed by {
(b) Clothing requisitions } higher authority { AR 35-6540
(c) Requisitions for expendables (or as needed) . . . OQMG Cir. 1-18, 1942
- 4. SEMIANNUALLY**
(a) Read Articles of War. AW 110
Enter in Service Record. AR 345-125
(b) Check Service Records. AR 345-125
(c) Physical inventory of property.
(d) Sex Morality Course. AR 40-235
- 5. ANNUALLY**
(a) Check supply and property records.
1. Company Property Book. WD Cir. 405, 1942
2. New M/R for post property where custodial system not used.
(b) Company orders.
(c) New correspondence file. AR 345-620
- 6. MISCELLANEOUS (throughout year.)**
(a) Allotments. AR 35-5520,

1. Class E
(Purposes: (1) support of allotter's family or dependent relatives, (2) to banks in the United States, (3) to commercial life insurance companies for payment of premiums. Authorizations made in duplicate on WD AGO Form 29. Duplicate is filed with service record. Send original, and all correspondence pertaining thereto to: "Office of Dependency Benefits, 213 Washington St., Newark, N. J.," see WD Cir. 382, 1942. Make notations on service record, pay roll and soldier's individual pay record. For discontinuance use WD AGO 30. Class E Allotments will be accepted from military personnel wherever situated, see WD Cir. 382, 1942. Chg. 1, 2, WD Cir. 382, 1942
2. Class D. AR 600-100, chg. 1
(Covers allotments for premiums for United States Government life insurance. Forms and procedure are same as with Class E Allotments. All forms and correspondence pertaining thereto will be forwarded to "Examination Division Bldg. X, 19th and B Sts., NE, Washington, D. C.") AR 35-5520, chg 1, 2, WD Cir. 382, 1942
3. Class N. AR 35-5520, chg. 1, 2, WD Cirs. 382, 387, 1942
(Allotments for premiums for National Service Life Insurance. Forms, procedure, and corresponding address same as with Class D Allotments, except applicant should mail duplicate to his beneficiary.)
- (b) Company Punishment Record. AW 104
(No entry made on service record, but company commander will keep record showing date, offense, party, and punishment. In case of transfer, record is filed but no transcript is forwarded to new commanding officer.) AR 345-125, par. 28 of chg. 3
- (c) Class F Deduction. Bull. 29, WD 1942
(WD AGO Form 625, Application for Family Allowances, is executed in triplicate. Have eligible enlisted man, grades 4 to 7 inclusive, sign before notary. "Original" is indorsed by personnel officer or organization commander and mailed to: "Allowance and Allotment Branch, War Department, Bldg. Y, 20th and B Sts., NE, Washington, D. C." "Official copy" is filed with soldier's service record, third copy is applicant's. On receipt of WD AGO 650, Notification of Action Taken on Application for Family Allowances, where same is approved, entry of proper pay roll notations and Soldier's Individual Pay Record and Card will be verified.) WD Cir. 225, 1942 WD Cir. 288, 1942

- (d) Discharge.
1. Certificate of Service.....AR 345-500
(Form is WD, AGO 280. Personnel officer WD Cir. 252, 1941 prepares in duplicate. The recipient and the commanding officer sign both copies.)
 2. Discharge Certificate.....AR 345-470, chg. 2
(Personnel officer prepares and sends to company commander for character entry and signature.)
 3. Final Statement.....AR 345-475
(Prepared in duplicate. Original only signed. Personnel officer certifies. Enlisted man presents original to proper disbursing officer for payment.) AR 35-2480
 4. Report of Physical Examination of Enlisted Man Prior to Discharge or Retirement.....AR 40-100
(Enlisted man will declare his physical condition thereon, and then be examined by Medical Officer within 72 hours prior to discharge. Not used where discharged for physical disability or because of sentence of civil court.)
- (e) Emergency Addressee and Personal Property Card.....WD Cir. 338, 1942
(WD, AGO 43 is prepared in and retained by personnel section. Cards will be prepared for personnel now overseas and sent to The Adjutant General. Send with Service Record in case of transfer. If ordered outside continental U. S. send to The Adjutant General.)
- (f) Furloughs, Passes and Delays.....AR 615-275, WD Cir. 133, 1941, 56, 79, 1942
(Furloughs to be 15 days or less except in emergency or return from overseas, may not exceed 15% of command at a time except as provided. 15% rule waived in case of men completing basic training.)
- (g) Report of Survey.....AR 35-6640, chg. 1, 3
(Prepared by responsible officer and forwarded to commanding officer in triplicate. Supporting evidence attached only to original copy. Is for property lost, destroyed or damaged other than by fair wear and tear in Government service.)
- (h) Qualification in Arms.....AR 345-1000
(Report is made on WD AGO 110 by unit personnel officer from data contained in original score cards or reports of boards of examination. Report is then referred to officer who supervised the record practice. He verifies report from

original score cards, signs certificate thereon, and returns it to unit headquarters. Personnel officer prepares classification order which the Adjutant signs and publishes. Organization commander destroys score cards upon receipt of classification order. Qualification of each man is entered by personnel officer under "Remarks" on WD AGO 20. Entry of qualification is made in the service record only in cases where extra compensation is granted, see chg. 1. Unit commander requisitions and issues qualification badges and bars. The Consolidated Report of Classification in Arms (WD AGO 111) is prepared by personnel officer.)

- (i) Pay Reservation—Class A. WD Cirs. 215, 314,
(Purchase of War Savings Bonds. Personnel officer 364, 368, 1942
prepares WD AGO 29-5 in quadruplicate. Original
and duplicate to Chief of Finance, triplicate in
personnel section, quadruplicate to subscriber.
To change or cancel, use WD AGO 30-5.)

- (j) Report of Desertion. AR 615-300,
(Report of Desertion and extract copies of Morn- chg. 2, 5, 6,
ing Reports prepared in duplicate, company com- AR 615-360
mander authenticates. Personnel officer sends the
2 copies to Adjutant General within 2 days after
man dropped as deserter. Within 5 days per-
sonnel officer sends original Report of Desertion,
Service Record, extract of Morning Report,
Individual Clothing Record, list of clothing left
by deserter, Qualification Card, supplemental
deserter's Pay Roll in duplicate, and evidence to
post commander, who will hold papers one year
at end of which time will transmit the supple-
mental pay roll to disbursing officer for settle-
ment. The original of Statement of Accounts is
attached to Service Record and all records are
forwarded to TAG.

- (k) Report of Death. AR 600-550
(In garrison and in the absence of a medical
officer WD AGO Form No. 52 ordinarily will be
prepared in triplicate and disposed of as indicated
in regulation. WD AGO Form No. 54 (Inventory
of Effects) will also be prepared. (See regulation
as changed.)

- (l) Soldier's Deposit Book. AR 35-2600
(FD Form 10, prepared by personnel officer, who
makes entry in service record and transmits copy
to Chief of Finance.)

- (m) Soldier's Handbook FM 21-100.
(Check to see issue to each enlisted man. Enter "FM 21-100 issued" with date in Remarks Administrative in service record.)
- (n) Soldier's Individual Pay Record Par. 11½, chg. 2
(Prepared by personnel officer and issued to enlisted man at time service record is initiated. Entries authenticated by personnel officer. Pay roll is prepared for casual payment to enlisted man when individual pay record is presented to any personnel officer for one who has been separated from his organization and service record. When casual payment is made, personnel officer will notify enlisted man's organization commander on WD AGO 19, Notice of Casual Payment, so proper entry may be made in service record.) AR 345-155
- (o) Soldier's Qualification Card AR 615-25, chg. 1, 2
(Will accompany the service record of men upon transfer. Personnel officer is custodian, and supervises organizational assignment of personnel. It is his responsibility to record all newly developed skills, and keep the card up to date. It is the responsibility of company commander to study qualification cards of his men so he may know their skills and abilities in making assignments and promotions. When enlisted man fires record course and fails to qualify, enter under "Remarks" showing weapon, course, and date firing completed. See WD Cir. 383, 1942.)
- (p) Statement of Charges WD AGO 36 AR 345-300
(Prepared by personnel officer in triplicate. One copy retained by personnel section, one to company, and one to appropriate supply officer.)

PART III

PERSONNEL ADJUTANT'S CHECK LIST

a. DAILY

1. Morning Report AR 345-400
Transcribe pertinent information to proper records and consolidate.
- (a) Service Record AR 345-125
- (b) Pay Cards and Soldier's Individual Pay Record AR 345-155,
Par. 11½

- (c) Report of Change.....AR 345-800
 - (d) Qualification Cards.....AR 615-25
 - 2. Correspondence.....AR 340-15
 - (a) Reports (required by higher headquarters).
 - (b) Letters.
 - (c) Files.....AR 345-620
 - 3. Preparation of headquarters' special orders.
 - 4. Officers' and/or first sergeants' call.
- b. WEEKLY**
- Check Sick Books for sicknesses affecting pay and time.....AR 35-1440
 - 1. Enter in Service Record.....AW 107
 - 2. Enter on Pay Cards.
- c. MONTHLY**
- 1. Check, correct, and return Monthly Roster to machine records unit.....AR 345-900
 - 2. Prepare pay rolls.....AR 345-155
- d. SEMIANNUALLY**
- Check all Service Records.....AR 345-125
- e. ANNUALLY**
- 1. Start new correspondence file.....AR 345-620
 - 2. Start new Special Order file.
- f. MISCELLANEOUS**
- 1. Allotments and Deductions.....AR 35-5520
 - 2. Classification in Arms.....AR 345-1000, chg. 1
 - 3. Consolidated Report of Classification in Arms.....AR 345-1000, chg. 1
 - 4. Discharge.....AR 615-360
 - 5. Emergency Addressee and Personal Property Card....WD Cir. 338, 1942
 - 6. Furloughs.....AR 615-275
 - 7. Initial, Special, and Final Rosters.....AR 345-900
 - 8. Insurance.....AR 35-5520
 - 9. Qualification Cards.....AR 615-25
 - 10. Report of Death (and allied papers).....AR 600-550
 - 11. Report of Desertion (and allied papers).....AR 615-300, chg. 2, 5, 6
AR 615-360

APPENDIX B

TABLE OF EQUIPMENT

GENERAL

1. This table is in accordance with AR 310-60.
2. In the case of allowances of equipment based upon the number of personnel, the amounts in Column 2, "Allowances" will govern.
3. Items of clothing and individual equipment, components of sets and kits, spare parts and accessories, and allowances of expendable items are contained in the following publications:

Chemical Warfare Service Standard Nomenclature and Price List; Chemical Warfare Service Circular No. 1, Allowances of Expendable Supplies.

Corps of Engineers Supply Catalog, Parts 1 and 2; Corps of Engineers Allowances Expendable Supplies, Series A.

Medical Department Supply Catalog (for Expendable Supplies, See Circular No. 26, SGO).

Ordnance Standard Nomenclature Lists (SNL), index to which is the Ordnance Publications for Supply Index (OPSI).

Circular No. 1-18, OQMG, Allowances of Expendable Supplies; Circular No. 4, OQMG, Components, Spare Parts, Accessories, and Contents of Chests, Kits and Sets, and Other Items of Quartermaster Property.

Signal Corps General Catalog; Circular No. 10-1, OCSigO, Allowances of Spare Parts, Accessories, and Expendable Supplies.

T/E 21, Clothing and Individual Equipment.

T/A Cleaning, Preserving, and Lubricating Materials, Recoil Fluids, Special Oils and Similar Items of Issue.

AR 30-3010, Items and Price List of Regular Supplies Controlled by Budget Credits, and Price List of Other Miscellaneous Supplies.

AR 310-200, Military Publications, Allowance and Distribution.

AR 775-10, Qualification in Arms and Ammunition Training Allowances.

CHEMICAL

1	2	3	4
Items	Allowances	For computation	Basis of issue and remarks
Alarm, gas, M1	1	.....
Apparatus, decontaminating:			
1½ qt, M2	40	.....	1 per fuel consuming mtr vehicle, except mtrcl.
3-gal, M1	6	.....
Curtain, gasproof, M1	10	.....	2 per 20 indiv or maj fraction thereof in T of Opns.
Kit, HS vapor detector, M4	1	.....
Mask, gas, service	107	.....	1 per indiv.
Respirator, dust, M2	80	.....	2 per wheeled fuel consuming mtr vehicle.

ENGINEER

1	2	3	4
Items	Allow- ances	For compu- tation	Basis of issue and remarks
Compass, watch.....	20	.....	1 per O; 1st sgt; s sgt. Upon availability, compass, wrist, liquid filled, will replace this item.

MEDICAL

Kit, first aid, motor vehicle, 12-unit.	10	.....	1 per 4 fuel consuming trks or fraction thereof.
Litter.....	1	.....

ORDNANCE

Carbine, cal. .30, M1A2.....	83	.....	1 per O; WO; NCO, 1st 3 gr; EM not otherwise armed.
Gun, machine, Browning, HB, cal. .50, M2, flexible.	10	.....	1 per 3 trks, 4-5-ton 4 x 4 trac.
Launcher:			
Grenade, M1.....	12	.....	1 per 2 rifles, US, cal. .30, M1903A3 or M1903A1.
Rocket, AT, 2.36-in., M1.....	5	.....
Rifle, US, cal. .30, M1903A3 or M1903A1.	24	.....	1 per 4 EM below 1st 3 gr.
Tool-set (complete with tools):	4	.....	1 per pvt auto mech (014).
Motor vehicle, mechanic's.			
Unit Equipment, Second Echelon Set No. 2.	1	.....
Trailer, 1-ton, 2-wheel, cargo.....	2	.....
Trucks:			
1/4-ton, 4 x 4.....	4	.....
3/4-ton, 4 x 4, weapons carrier.....	3	.....
2 1/2-ton, 6 x 6, cargo.....	2	.....
4-5-ton, 4 x 4, tractor.....	30	.....	1 per semitr, 2-wheel, 10-ton, refrigerator (10 w/ring mount).
4-ton, 6 x 6, wrecker, complete-with-equipment.	1	.....

QUARTERMASTER Individual Equipment

Bag, canvas, field, od, M-1936.....	4	.....	1 per O.
Belt: Cartridge, cal. .30, dis-mounted, M1923.	24	.....	1 per dismtd indiv armed w/rifle, US, cal. .30, M1903A3 or M1903A1.
Pistol or revolver, M-1936.....	83	.....	1 per indiv armed w/carbine, cal. .30, M1A2.
Carrier, pack, M-1928.....	103	.....	1 per EM.

1	2	3	4
Items	Allowances	For computation	Basis of issue and remarks
Cover, canteen, dismounted, M-1910.	107	.....	1 per indiv.
Haversack, M-1928.....	103	.....	1 per EM.
Pocket, magazine, double web, for carbine, cal. .30, M1.	83	.....	1 per indiv armed w/carbine, cal. .30, M1A2.
Strap, bag, canvas, field, od, M-1936, carrying.	4	.....	1 per bag, canvas, fld, od, M- 1936.
Suspenders, belt, M-1936.....	4	.....	1 per O.

Organizational Clothing

Brassard, arm, gas.....	6	.....	1 per gas sentry; gas NCO, and gas O.
Gloves, protective, impermeable.....	5	.....	1 per 40 EM outside conti- nental US. (To be stored in nearest available depot, for issue as determined by T of Opns comdr.)
Mittens, asbestos, M-1942.....	21	.....	1 per armr (511); 2 per MG, cal. .50.
Suit, protective, one-piece, imper- meable.	5	.....	1 per 40 EM outside conti- nental US. (To be stored in nearest available depot, for issue as determined by T of Opns comdr.)

Organizational Equipment

Axe, intrenching, M-1910, with- handle.	11	.....	1 per 10 indiv.
Bag:			
Canvas, water sterilizing, com- plete, with cover-and-hanger.	1	.....	Per 100 indiv or maj fraction thereof.
Carrying, rocket, M6.....	10	.....	2 per launcher, rocket, 2.36-in, M1.
Delousing.....	6	.....	1 per 20 indiv or fraction thereof, where typhus fever is moder- ately intense; where typhus is intense, 1 per 10 indiv or fraction thereof; where typhus is moderate, 1 per 30 indiv or fraction thereof, as approved by T of Opns comdr.
Bucket, general-purpose, galvanized, heavy-weight, without-lip, 14-qt.	2	.....

1	2	3	4
Items	Allow- ances	For compu- tation	Basis of issue and remarks
Cans, corrugated, nesting, galvanized, with-cover:			
10-gallon.....	1	.....
16-gallon.....	1	.....
24-gallon.....	1	.....
32-gallon.....	1	.....
Water, 5-gallon.....	11	.....	1 per 10 indiv or fraction thereof.
Carrier:			
Axe, intrenching, M-1910.....	11	.....	1 per axe, intrenching, M-1910, w/handle.
Pick-mattock, intrenching, M-1910.....	22	.....	1 per pick-mattock, intrench- ing, M-1910, w/handle.
Shovel, intrenching, M-1910.....	77	.....	1 per shovel, intrenching, M-1910.
Case, canvas, dispatch.....	1	.....	Per 1st sgt.
Desk, field, empty, fiber, company.	1	.....
Drum, inflammable-liquid (gasoline), with carrying-handle, 5-gallon.	76	.....	1 per trk, 1/4-ton, 4 x 4; 2 per trk, 2 1/2-ton, 6 x 6, cargo; trk, 3/4-ton, 4 x 4, wpns carr; trk, 4-5-ton, 4 x 4, trac; trk, 4-ton, 6 x 6, wkr.
Flag, guidon, bunting.....	(1)	.....
Fly, tent, wall, large (complete, with- pins-and-poles).	1	.....
Goggles, M-1942, complete.....	76	.....	1 per driver, 1/4-ton trk; 2 per 3/4-ton trk; 2 1/2-ton trk; 4-ton trk.
Heater, immersion type, for cans, corrugated.	2	.....	Per range, fld, M-1937.
Kit:			
Barber, with-case.....	1	.....	Outside continental US.
Sewing.....	9	.....	1 per 12 EM.
Lantern:			
Electric, portable, hand.....	1	.....
Gasoline, 2-mantle, commercial.....	2	.....
Outfit, cooking, 1-burner.....	10	.....	1 per 4 fuel-consuming mtr vehicles except mtrcls.
Pick-mattock, intrenching, M-1910, with-handle.	22	.....	2 per 10 indiv.
Range, field, M-1937, 3-unit.....	1	.....	Per orgn (or mess) 101-225 men.
Screen, latrine.....	1	.....
Semi-trailer, 2-wheel, 10-ton, refrig- erator.	30	.....
Shovel, intrenching, M-1910.....	77	.....	7 per 10 indiv.
Stretcher, shoe (sizes 0, 1 and 2).....	(1)	.....
Tool-kit (complete with tools), Car- penter's.	1	.....
Typewriter, portable.....	1	.....
Whistle, thunderer.....	5	.....	1 per co comdr; co lt; 1st sgt.

SIGNAL

1	2	3	4
Items	Allow- ances	For compu- tation	Basis of issue and remarks
Flashlight TL-122-().....	12	.....	1 per O; t sgt; 1st sgt; s sgt.

APPENDIX C

CLOTHING AND EQUIPMENT REQUIRED FOR OFFICERS ORDERED OVERSEAS

On the following pages are listed the clothing and personal equipment needed by an officer for duty overseas. This list is normally distributed at staging areas, but it is believed that knowledge of it beforehand may save officers time and effort.

BUY: Purchase yourself.

ISSUE: Issued by Government
at port of Embarkation.

	ON PERSON	PERSONAL BAGGAGE BY AIR	BY EXPRESS AND WATER FOR AIR PASSENGERS	PERSONAL BAGGAGE FOR WATER PASSENGERS	LATE FREIGHT FOR ALL	MINIMUM TOTAL
CLOTHING						
B Belt, cloth waist.....	1	..	..	..	..	1
U Belt, Sam Browne	1	..	..	..	..	1
Y Coat, woolen	1	..	..	..	..	1
Underwear, cotton.....	1	2	9	12	..	12
Handkerchiefs.....	2	10	12	22	..	24
Jacket, Field.....	..	1	..	1	..	1
Overcoat or trench coat w/rem. lining.....	1	..	..	..	..	1
Pajamas.....	..	2	..	2	..	2
Slippers.....	..	1	..	1	..	1
Underwear, woolen.....	..	..	2	2	..	2
Shirts, khaki.....	1	5	6	11	..	12
Shirts, woolen.....	..	1	1	2	..	2
Trousers, woolen.....	1	..	1	1	..	2
Trousers, khaki.....	..	4	2	6	..	6
Socks, cotton, tan.....	1	5	6	11	..	12
Socks, woolen.....	..	..	..	..	4	4
Ties, black.....	1	..	1	1	..	2
Ties, tan.....	..	2	..	..	2	2
Raincoat.....	..	1	..	1	..	1
Muffler, wool.....	..	..	1	1	..	1
Cap (overseas, wool).....	1	..	..	..	..	1
Gloves, wool.....	1	..	1	2	..	2
Bathrobe, cotton.....	..	..	1	1	..	1
Cap (overseas, cotton).....	..	1	1	2	..	2
Insignia, sets.....	1	2	1	3	..	4
Leggings.....	..	1	1	2	..	2
Shoes, high, tan w/2 extra pr. laces.....	1	1	1	2	..	3
Shoes, low, tan, w/2 extra pr. laces.....	..	..	1	1	..	1
Overshoes, high, rubber, arctic.....	..	..	1	1	..	1
Boots, rubber, hip (optional).....	..	..	1	1	..	1

This allowance to be 1/2 weights.
Ind. Par. 3 Chg. C AR 30-969.

BUY: Purchase yourself.
 ISSUE: Issued by Government
 at port of Embarkation.

		ON PERSON	PERSONAL BAGGAGE BY AIR	BY EXPRESS AND WATER FOR AIR PASSENGERS	PERSONAL BAGGAGE FOR WATER PASSENGERS	LATE FREIGHT FOR ALL	MINIMUM TOTAL
EQUIPMENT							
I S S U E	Bag, Mussette-bag, field, canvas.....	1	..	..	..	..	1
	Belt, web.....	1	..	..	..	..	1
	Canteen, cup and cover.....	1	..	..	..	..	1
	Meat can, knife, fork, spoon.....	1	..	..	..	..	1
	Wash basin, folding, canvas.....	..	..	1	1	..	..
	Case, (dispatch).....	1	..	..	..	..	1
	Helmet, trench.....	..	1	..	1	..	..
	Tags, identification.....	2	..	..	..	..	2
	Mask, gas.....	1	..	..	..	..	1
	Suspenders, Off. type.....	1	..	..	..	..	1
	Pouch, first aid.....	1	..	..	..	..	1
	Watch.....	1	..	..	..	..	1
	Compass.....	..	..	..	..	..	..
	Field message book.....	1	..	1	2	..	2
	Packet, first aid.....	1	..	..	..	..	1
MISCELLANEOUS							
B U Y	Brush, shoe.....	..	..	1	1	..	1
	Brush, clothing.....	..	..	1	1	..	1
	Cleaning materials (shoe and brass).....	..	..	1	1	..	1
	Flashlight, 2-cell comp. w/ex. bat. and blb.....	1	..	..	..	..	1
	Knife, pocket.....	1	..	..	..	..	1
	Lighter.....	1	..	..	..	..	1
	Fluid (extra).....	..	..	1	1	..	..
	Mirror (steel).....	..	1	..	..	..	1
	Whistle.....	1	..	..	..	..	1
	Comb and Brush.....	..	1	..	1	..	1
	Repair kit (housewife).....	..	1	..	1	..	1
	Shaving equipment.....	..	1	..	1	..	1
	Soap (in container).....	..	1	..	1	..	1
	Razor blades.....	..	10	100	100	100	200
	Towel, face.....	..	1	6	7	12	19
	Towel, bath.....	..	1	5	6	..	6
	Toilet preparations (misc. units) tooth brush, etc.....	..	1	1	2	12	14
	Medicines (misc. units).....	..	1	..	1	6	6
	Nail file.....	..	1	..	1	..	1
	Fountain pen and pencil.....	..	1	..	..	..	1
	Cigars and cigarettes (cart. or boxes).....	..	1	..	1	11	12
I S S U E B U Y	Tents, shelter halves-poles and pins.....	..	..	2	2	..	2
	Blankets.....	..	1	2	3	..	3
	Sleeping bag and/or bed rolls.....	..	..	1	1	..	1
	Bar, mosquito.....	..	..	1	1	..	1
	Headnet, mosquito.....	..	..	1	1	..	1
	Locker trunk.....	..	..	2	2	..	2
	Suitcase or zipper packs.....	1	1	..	1	..	1
	Books, professional, etc.....	..	..	..	..	..	..
	Matches, packages of 12.....	..	1	5	6	..	6
	Maps.....	..	..	..	..	..	..
	Polaroid sun glasses.....	1	..	..	..	..	1

This allowance to be 1/2 weights
 Ind. Par. 3 Chg. C AR 30-969

APPENDIX D

REFERENCES

This appendix contains a list of publications which will be of value to the key personnel of the company. These publications are listed under the title of the officer or noncommissioned officer to whom they most closely pertain.

1. COMMISSIONED OFFICERS. TM 12-250, Administration, and other publications dealing with the general administration of the company should be studied by each officer. In addition, the manuals and bulletins listed below will enable commissioned officers and their key noncommissioned personnel to be better prepared for dealing with conditions in various theaters of operations:

- a. FM 31-20, Jungle Warfare.
- b. FM 31-25, Desert Operations.
- c. FM 100-5, Field Service Regulations, Operations.
- d. FM 100-10, Field Service Regulations, Administration.
- e. FM 10-5, Quartermaster Field Manual—Quartermaster Operations.
- f. FM 10-10, Quartermaster Field Manual—Quartermaster Service in Theater of Operations.
- g. FM 17-10, Armored Force Field Manual, Tactics and Technique.
- h. TM 10-610, Refrigeration.
- i. Subsistence Bulletin No. 21, Refrigeration.

2. FIRST SERGEANT. In general, the first sergeant should become familiar with the contents of AR 1-6, 1-10, FM 21-6, and TM 12-250. With these aids, he will have very little difficulty in determining the publications required for general use in the orderly room. By referring to AR 310-100, 310-105, and 310-200, he can readily ascertain the AGO forms required in company administration. He will find the Quartermaster Corps forms which he needs in Circular No. 1-17, OQMG. Among the first Army Regulations with which he should become thoroughly familiar is the AR 35 Series. When the company arrives in the theater of operations it will maintain a file of technical bulletins issued by headquarters. The first sergeant's office is the place of safe-keeping for all publications, correspondence, and records. When they are not being used they should be returned to the first sergeant so that they will be available for the use of other personnel. Following this

procedure is particularly important when the company has only one copy of any publication.

3. TECHNICAL SERGEANT, REFRIGERATION ENGINEER. This noncommissioned officer will find several publications valuable to his work:

- a. Subsistence Bulletin No. 21, Refrigeration.
- b. TM 10-610, Refrigeration.
- c. Marks Mechanical Engineers' Handbook.
- d. The publications of the American Society of Refrigeration Engineers.
- e. The Refrigerating Data Book. (Refrigerating Engineer).
- f. Handbook of Mechanical Refrigerating Engineering (Woolrith).
- g. Refrigerating Engineering (MacIntire).
- h. Refrigeration (Moyer and Fitz).

Of this list, the first two are official publications. The War Department will not furnish the other references, but they will be available in libraries. This noncommissioned officer will probably have a number of these publications in his possession.

4. STAFF SERGEANT (MESS). Some of the publications he should consult are:

- a. WD Cir. No. 16, 1943.
- b. TM 10-405, The Army Cook.
- c. TM 10-410, The Army Baker.
- d. TM 10-205, Mess Management and Training.
- e. Baking Manual for the Army Cook.
- f. Tentative TM 10-406, Dehydrated Foods Cooking Manual.

5. STAFF SERGEANT (MOTOR).

- a. FM 25-10, Motor Transport.
- b. TM 10-510, The Motor Vehicle.
- c. TM 9-2810, Motor Vehicle Inspection and Preventive Maintenance Servicing.
- d. Maintenance manuals for the vehicles of the company.

6. STAFF SERGEANT (PLATOON SERGEANT).

In addition to the contents of this handbook, he should become familiar with the contents of the publications listed in pars. 1 and 3 above.

7. STAFF SERGEANT (SUPPLY). Practically all of the references used by the supply sergeant are listed below:

- a.** Table of Organization and Equipment No. 10-247.
- b.** Table of Allowances.
- c.** Circular 1-18, OQMG.
- d.** Circular 4, OQMG.
- e.** Current WD Circulars on supply matters.
- f.** Nomenclature Lists or Supply Catalogs for Chemical Warfare Service, Medical Department, Corps of Engineers, Signal Corps, Air Corps.
- g.** Quartermaster Supplement to Federal Standard Stock Catalog.
- h.** Blank Forms Pertaining to Property Accounting, AR 35-6720.
- i.** Allowances and Distribution; AGO Forms with AR References, AR 310-105.
- j.** Weekly and monthly laundry lists, QMC forms, AR 30-2135.
- k.** Allowances of target accessories, AR 760-400.
- l.** Allowances of ammunition, AR 775-10.
- m.** Enlisted Men's Clothing and Equipage, AR 615-40.
- n.** Simplified Accounting Procedure, WD Cir. No. 405, 1942.
- o.** Deserters' clothing, par. 8, AR 615-300.
- p.** Fitting shoes and socks, AR 850-125.
- q.** Price List, Clothing and Equipage, AR 30-3000.
- r.** Price list, china and glassware, AR 30-3010.
- s.** Requisitioning, AR 35-6540.
- t.** Receipt, Shipment, Issue, AR 35-6560.
- u.** Marking, AR 850-5.
- v.** Property Accountability and Responsibility, AR 35-6520.

- w.** Property expendable when issued, AR 35-6620.
- x.** Property lost, damaged, destroyed or unserviceable, AR 35-6640.
- y.** Surveys, WD Cir. 66, 1942.
- z.** Transfer of property, pars. 3, 4, 5, AR 35-6680.
- aa.** TM 10-310, Property Accounting.
- ab.** Text, "Unit Supply," The Quartermaster School.

8. SERGEANT (SECTION LEADER). He should become generally familiar with the contents of Subsistence Bulletin No. 21. He should also become generally familiar with other references used by the technical sergeant (refrigeration engineer).

9. CORPORAL (COMPANY CLERK). See par. 2, above.

10. CORPORAL (ASSISTANT SECTION CHIEF). See par. 8, above.

11. REFRIGERATION MECHANICS. These technicians and privates work under the general technical direction of the technical sergeant (refrigeration engineer). He will make pertinent extracts of technical material used by him and will distribute it to these men. Each refrigeration mechanic should have in his possession and should consult frequently the manuals and other publications prepared by the manufacturers of the refrigeration semitrailers.

12. OTHER TECHNICIANS AND PRIVATES. These men work under the supervision of noncommissioned officers and should become generally familiar with the publications used by their official superiors. Some of them may be called upon to take charge of certain work when noncommissioned officers are disabled. For example, the first cook may take over the duties of the mess sergeant; or one of the refrigeration mechanics may be called upon to take over temporarily the duties of the technical sergeant (refrigeration engineer). The technicians and privates listed below have specialties not previously discussed.

a. Bugler and messenger. TM 20-250, Field Music. When not performing his duties as bugler, he operates in the message center of the office under the first sergeant. If the work of the company makes it desirable that this soldier have some knowledge of the technical matters

of the company, he will familiarize himself with certain publications indicated by the first sergeant.

b. Truck driver. He should become familiar with FM 25-10, the technical manuals of the 10 series which pertain to the type of vehicle he will drive, and with TM 10-460, Driver's Manual.

c. Automobile mechanic. See par. 5 above. He should become thoroughly familiar with the technical manuals of the 10 series which pertain to the vehicles he must maintain. His functions are in the second echelon of motor maintenance.

APPENDIX E

LOADING AND STORAGE DATA

Commodity	Unit	Occupancy Cubic feet	Safe holding temperature
Apples—loose	Std. Field Box—45#	1.7	32° Min.
Apples—packed	Std. Field Box—55#	1.95	32° Min.
Berries—crated	Crate—9#	.48	32° Min.
Berries—bbls.	Bbl.—500#	13.36 one tier on end	32° Min.
Butter	100# net	2.33	32° Max.
Citrus fruits	Std. Box—90#	3.	32° Min.
Cannery fruit	Field lug—50#	2.2	32° Min.
Celery—std. crate	Crate—110#	10.1 on rack	32° Min.
Celery—half crate	Half-crate—80#	5.6 on rack	32° Min.
Cheese	100# net	2.89	34° Max.
Eggs—30 doz. case	Case—56#	2.64	30° Min.
Eggs—cans—frozen	Can—30#	.79	32° Max.
Fish—boxes—cured	100# net	2.99	35° Max.
Fish—boxes—frozen	100# net	3.63	32° Max.
Fish—cured—bbls.	500#	9.3 one tier on end	35° Max.
Fish—loose—frozen	100# net	3.89	32° Max.
Grapes—packed sawdust	50# chest—export	1.72	32° Min.
Army ham and bacon—boxes	Box—100#	3.2	35° Max.
Meat—boxes	100# net	4.02	32° Max.
Meat—boned and packaged	100# net	3.00	32° Max.
Meat carcass—frozen	100#	4.56	32° Max.
Meat carcass—hung	100#	6.0	32° Max.
Pears—lugs covered	Lug—50#	2.37	32° Min.
Poultry—boxes	100#	3.48	32° Max.
Fruits—table	100#	3.5	32° Min.
Vegetables—50# sack	50#	2.0 on racks	32° Min.
Vegetables—100# sack	100#	4.4 on racks	32° Min.

APPENDIX F

GLOSSARY

A

Accountability. See AR 35-6520.

Acid. A substance sour to taste. Acids will redden vegetable blues and will neutralize alkalis by combining with them to form salt.

Administration. When unqualified, administration includes all phases of military operations not involved in the terms "tactics" and "strategy." It comprises supply, evacuation, sanitation, construction, maintenance, replacements, transportation, traffic control, salvage, graves registration, burials, computations pertaining to movements, personnel management, quartering, military government, martial law, censorship, and other allied subjects.

Alkali. A substance having a caustic taste. Alkalis will turn vegetable red to blue and will neutralize an acid.

Ampere. A unit for measuring the rate of flow of electricity. The current produced by a potential of 1 volt impressed across a resistance of 1 ohm.

Audit. An audit is an official examination and authentication of accounts, with vouchers, etc. The general purpose of an audit is to determine whether:

1. Regulations governing property accountability have been observed.
2. The Stock Record Account reflects a true accounting of all property. (See AR 35-6740.)

Automatic supply. A process of supply under which deliveries of specific kinds and quantities of supplies are moved in accordance with a predetermined schedule. Daily automatic supply means that supplies are dispatched daily to an organization or installation.

B

Balanced stocks. Accumulation of supplies of all classes and in quantities determined as necessary to meet requirements for a fixed period of time.

Braze. A process of welding, using brass; to solder with brass.

BTU. (Abbreviation for British Thermal Unit.) The quantity of heat required to raise the temperature of 1 pound of water one degree Fahrenheit.

C

Call. Demand for delivery of supplies covered by credits.

Carbon tetrachloride. A noninflammable, highly volatile liquid used in pump and pressure type fire extinguishers. It is a nonconductor of electricity.

Charging valve. A valve normally found on all systems, usually located in the liquid line between the receiver and expansion valve. It is used for removing or adding refrigerant.

Circuit. The entire course through which an electric current flows.

Class I supplies. Those articles, such as rations and forage, which are consumed at an approximately uniform daily rate irrespective of combat operations or terrain and which do not necessitate special adaptation to meet individual requirements.

Class II supplies. Those authorized articles for which allowances are established by Tables of Basic Allowances and Tables of Allowances, such as clothing, gas masks, arms, trucks, radio sets, tools, and instruments.

Class III supplies. Engine fuels and lubricants, including gasoline for all vehicles and aircraft, Diesel oil, fuel oil, and coal.

Class IV supplies. Those articles of supply, such as fortification materials, construction materials, and machinery, which are not covered in Tables of Basic Allowances and demands for which are directly related to operations contemplated or in progress (except for articles in classes III and V).

Class V supplies. Ammunition, pyrotechnics, antitank mines, and chemicals.

Cold. The absence of heat.

Combat zone. A combat zone comprises that part of a theater of operations required for the active operations of the combatant forces. It is divided into army, corps, and division areas, each comprising the zone of operations of the unit to which it pertains. (See FM 100-5.)

Communications zone. A communications zone is that part of a theater of operations, contiguous to the combat zone, which contains the lines of communication, establishments for supply and evacuation,

and other agencies required for the immediate support and maintenance of the field forces in the theater of operations. (See FM 100-5.)

Compressor. A mechanical device used in refrigeration for extracting the low pressure gases from the evaporator, and discharging it under high pressure into the condenser.

Condenser. A device for lowering the temperature of the high pressure gases to the point where they are reconverted to their original liquid state.

Condensing unit. A term applied to an assembly of a compressor with driver, condenser, and receiver.

Conductivity. The quality of a material to transmit heat, usually expressed in B. T. U.s per hour, per inch of thickness, per unit of area.

Control point. Agency established by a unit at a convenient point on the route of its trains where information and instructions are given and received in order to regulate supply or traffic.

Credit. Allocation of a definite quantity of supplies which is placed at the disposal of the commander of an organization for a prescribed period of time.

Cycle. A series of events, operations or phenomena that repeat themselves in order such as the cycles of a refrigerating system.

D

Daily telegram. Telegram or other message dispatched daily by divisions and larger units giving the unit's situation relative to supplies. A strength report is included. The telegram contains the information necessary to compute the quantities class I and class III supplies forwarded each day.

Daily train. Train arriving daily at railhead with supplies for troops which the railhead serves.

Day of supply. Estimated average expenditure of various items of supply per day in campaign expressed in quantities of specific items or in pounds per man per day.

Density. The mass of matter per unit of volume, proportional to specific gravity, since matter is proportional to weight.

Depot. Organized locality for the reception, classification, storage, issue, or salvage of supplies, or for the reception, classification, and forwarding of replacements. Arm or service depots pertain to a single

arm or service and general depots pertain to two or more supply arms or services; for example: First Army Quartermaster Depot No. 1 or Communications Zone General Depot No. 3.

Dew point. Temperature point at which moisture vapor will begin to condense.

Distributing point. Place other than a depot or railhead where supplies are issued to regiments and small units. Distributing points are designated by the class of supplies therein, and by the identity of the unit establishing them; for example: Class I Distributing Point, 1st Division, or Ammunition Distributing Point, 1st Infantry.

Down time. In a depot, down time is that period of time elapsing between the receipt of a request for supplies and the actual delivery of the supplies into the hands of the troops making the request.

Dues-in. Dues-in represent supplies which have been requisitioned but not yet received.

Dues-out. Dues-out represent supplies for which a requisition has been received but not yet filled.

Dump. Temporary stock of supplies established by a corps, division, or smaller unit. When supplies are ordered issued from dumps, they become distributing points. Dumps are designated by the identity of the unit establishing them and by the class of supplies therein, such as 1st Infantry Ammunition Dump or 1st Division Class I Supply Dump.

E

Efficiency, mechanical. A term intended to express the ratio of indicated horsepower to that available for doing work.

Efficiency, volumetric. The ratio of the capacity of the compressor to displacement. The capacity is the actual amount of vapor compressed and delivered, expressed in cubic feet per minute.

Element. An element contains only one substance and cannot be decomposed.

Entropy. A mathematical factor which is the measure of the unavailable energy in a thermodynamic system.

Evaporator. That part of the refrigerating equipment which receives the liquid refrigerant and into which the heat passes from the commodity to be cooled, evaporating the refrigerant.

Expansion valve. The term applied to a valve located in the liquid line of the evaporator which controls the rate of flow of liquid refrigerant.

F

Fifth wheel. The connection between the tractor and the trailer designed to permit longitudinal and horizontal movement without affecting the security of connection.

Force. That which tends to produce or destroy motion.

Fusion. A term applied to the process of the change of state of a substance; for instance, from liquid to solid.

H

Halide torch. A torch used for detecting leaks in refrigerating systems.

Heat, latent. The heat required to change the physical state of a substance without a change of temperature.

Heat, sensible. The heat required to change the temperature of a body without changing its physical state.

Heat, specific. The amount of heat required to change a pound of a substance one degree fahrenheit without change of state.

Holding and reconsignment point. Rail or motor center with considerable capacity to which cars or trucks may be sent and at which they may be held until their destination becomes known or until the proper time for them to be moved toward their destination. This is an agency of the zone of the interior, and in a contiguous theater usually is the point at which the theater commander assumes responsibility for the movement.

Horsepower. A unit of power or rate of performance of work; 33,000 foot-pounds per minute.

Humidity. The moisture suspended in air.

Hygrometer. An instrument for measuring the humidity in the air, with wet bulb and dry bulb thermometers.

I

Infiltration. A term applied to the wall leakage and heat in air leakage.

L

Lines of communications. Network of railways, waterways, and roads which lead into the combat zone from administrative estab-

lishments located in the communications zone or in the zone of the interior.

M

Manifold. A pipe having several outlets for connecting one pipe with others.

Mass. The quantity of matter a body contains.

Mercury gage. The instrument for reading air pressure by ounces.

Micrometer. An instrument for measuring distances, thicknesses, diameters, etc., in thousandths of inches.

O

Ohm. The unit of electrical resistance. A conductor of 1 ohm resistance allows 1 ampere of current to flow when 1 volt of pressure is impressed on it.

P

Park. Area used for the purpose of servicing, maintaining and parking vehicles.

Power. The rate at which work or mechanical energy is performed.

Pressure. The force uniformly applied over an area. The unit of pressure is pounds per square inch above atmospheric pressure and is known as gage pressure. Adding atmospheric pressure gives absolute pressure.

Pressure relief valve. A safety device to prevent excessive pressure in a refrigeration system.

Priorities. Definite rulings which establish, in order of time, the precedence of shipments and movements of rail, road, water, or other transport.

R

Radiation. The transfer of heat between bodies separated from each other by an appreciable distance.

Railhead. Supply points where loads are transferred from rail to another type of transportation, generally motorized trains. A railhead may be established for any class or classes of supplies. Examples: Class I Railhead, 1st Division; Class V Railhead, First Army.

Receiver. A pressure container used in a refrigeration cycle to receive liquid refrigerant from the condenser and supply liquid to the liquid line, meanwhile retaining excess liquid refrigerant.

Refrigerant. In this handbook "refrigerant" applies to a liquid of low boiling temperature used in the system for transferring heat from the refrigerating chamber.

Refrigeration. The process of removing heat.

Regulation station. Traffic control agency established on lines of communications and through which movements are directed and controlled by the commander of the theater of operations.

Relay. A term used to denote an electrical device for closing or opening a switch.

Requisition. Request for supplies, usually on a form furnished for the purpose. The word is also used to signify the purchase of supplies by demand in hostile, occupied territory. (FM 100-10).

Reserves. Supplies accumulated in excess of immediate needs for the purpose of insuring continuity of adequate supply. Also designated as reserve supplies. Battle reserves are supplies accumulated by the army, detached troops, or detached divisions in the vicinity of the battlefield in addition to unit and individual reserves. Individual reserves are those carried on the soldier, animal, or vehicle for his or its individual use in emergency. Unit reserves are prescribed quantities of supplies carried as a reserve by a unit.

Responsibility. Responsibility is the state of being liable which devolves upon any person having public property in his physical possession.

S

Saturation. A condition of air, such that it can hold no more moisture.

Service valve. A valve used for service operations at junctions of suction lines and discharge lines.

Specific gravity. The ratio of the weight of a given body to that of an equal volume of water.

Specific volume. The volume of one pound of substance.

State. This applies to the physical condition of a substance, such as solid state, liquid state or vapor state.

Stock record account. A stock record account is a uniform, complete, and accurate record, showing quantities of property on hand, received, and issued. It is kept on WD QMC Form 424 (Stock

Record Card), or an authorized modification, by all officers having accountability for property.

Sublimation. The physical phenomenon of a solid changing to a vapor without passing through a liquid state.

Supplies. In a military sense, the term covers all items necessary for the equipment, maintenance, and operation of a military command, including food, clothing, equipment, arms, ammunition, fuel, forage, and materials and machinery of all kinds.

Supply establishment. 1. General. Supply establishments are those establishments by means of which the supply functions of chiefs of arms and services are accomplished, such as arsenals, manufacturing plants, and depots.

2. Depots. Depots are supply establishments maintained primarily for the purpose of receiving, storing, and distributing supplies. They may be charged with other functions, including procurements, as directed by regulations and orders.

Supply point. A generic term used to include depots, railheads, dumps, and distributing points.

T

Tachometer. An instrument for indicating the revolutions of a machine.

Tally-in. A tally-in is a list of the items received in a shipment, compiled from packing lists, invoices, and inventory by the personnel receiving the shipment, for later comparison with the corresponding shipping ticket.

Tally-out. A tally-out is a list of the items being included in a shipment, compiled by the personnel making up the shipment, for later use in making out the corresponding shipping ticket. If the shipment is delivered directly to the consignee at the depot, the tally-out, signed by the consignee, acts as a temporary receipt, pending the return of the signed shipping ticket.

Temperature. The degree of heat or cold measured on a definite scale.

Tensile strength. The force per unit area required to rupture by tension.

Theater of operations. A theater of operations is an area of the theater of war necessary for military operations and the administra-

tion and supply incident to military operations. The War Department designates one or more theaters of operations.

Theater of war. The theater of war comprises those areas of land and sea which are, or may become, directly involved in the operations of war. That part of the theater of war within the control of each belligerent is usually divided into a zone of the interior and one or more theaters of operations.

Thermo-dynamic. Pertaining to the transfer of heat energy into motion, or the relation between the two.

Thermostat. A device sensitive to temperature and capable of transmitting changes within itself to a motor or valve or other piece of equipment.

Train. The train of a unit is that portion of the unit's transportation, including personnel, operating under the immediate orders of the unit commander primarily for supply, evacuation, and maintenance. It is designated by the name of the unit, such as 1st Infantry Train.

V

Vacuum. A space entirely devoid of matter and exhausted to a high degree by an air pump.

Vaporization. The conversion of a liquid into a vapor.

Velocity. Time rate of motion in a given direction.

Volt. The unit of electromotive force required to send a current of one ampere through a conductor of one ohm resistance.

Voucher. Any instrument which authorizes an accountable officer to pick up or drop property from his stock record account is a voucher. Each entry made in the stock record account must be supported by a valid voucher.

W

Watt. A unit of measurement of electrical power. One watt of power equals one ampere of current, times 1 volt potential.

Wet bulb depression. The difference between the wet bulb and dry bulb thermometer readings.

Z

Zone of the interior. The zone of the interior comprises the area of the national territory exclusive of areas included in the theaters of operations.

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